

Service Manual

Cassette Deck

RS-M250

 (Silver Face)
 (Black Face)

 Microprocessor-Controlled Stereo Cassette Deck
 with Electronic Digital Tape Counter


This is the Service Manual for the following areas.

- ☐ For all European areas except United Kingdom.
☐ For United Kingdom.

RS-M250 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback	Outputs:	LINE; output level 700 mV, output impedance 3 k Ω or less, load impedance 22 k Ω over
Tape speed:	4.8 cm/s		HEADPHONE; output level 85 mV (at 8 Ω), load impedance 8 – 125 Ω
Wow and flutter:	0.04% (WRMS), $\pm 0.13\%$ (DIN)	Rec/pb connection:	5 pin DIN type; input sensitivity 0.25 mV, input impedance 6.8 k Ω output level 700 mV, output impedance 4.7 k Ω
Frequency response:	Metal tape; 20–20,000 Hz 30–18,000 Hz (DIN) 30–17,000 Hz ± 3 dB CrO ₂ /Fe-Cr tape; 20–18,000 Hz 30–18,000 Hz (DIN) 30–16,000 Hz ± 3 dB Normal tape; 20–17,000 Hz 30–16,000 Hz (DIN) 30–15,000 Hz ± 3 dB	Bias frequency:	85 kHz
Signal-to-noise ratio:	Dolby* NR in; 67 dB (above 5 kHz) Dolby NR out; 57 dB (Signal level = max. recording level, Fe-Cr/CrO ₂ type tape)	Motor:	2-motor system; 1-Electrical DC governor motor, 1-DC motor
Fast forward and rewind time:	Approx. 80 seconds with C-60 cassette tape	Heads:	2-head system; SX head for record/playback Ferrite double-gap head for erasure
Inputs:	MIC; sensitivity 0.25 mV, input impedance 50 k Ω applicable microphone impedance 400 Ω –10 k Ω LINE; sensitivity 60 mV, input impedance 47 k Ω	Power requirement:	AC; 110/125/220/240 V, 50-60 Hz
		Power consumption:	20 W
		Remote:	For PLAY/REC/FF/REW/PAUSE/REC-MUTE/ STOP with optional remote control RP-9645
		Dimensions:	43.0 cm (W) \times 11.9 cm (H) \times 29.3 cm (D)
		Weight:	5.3 kg

Specifications are subject to change without notice.

* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

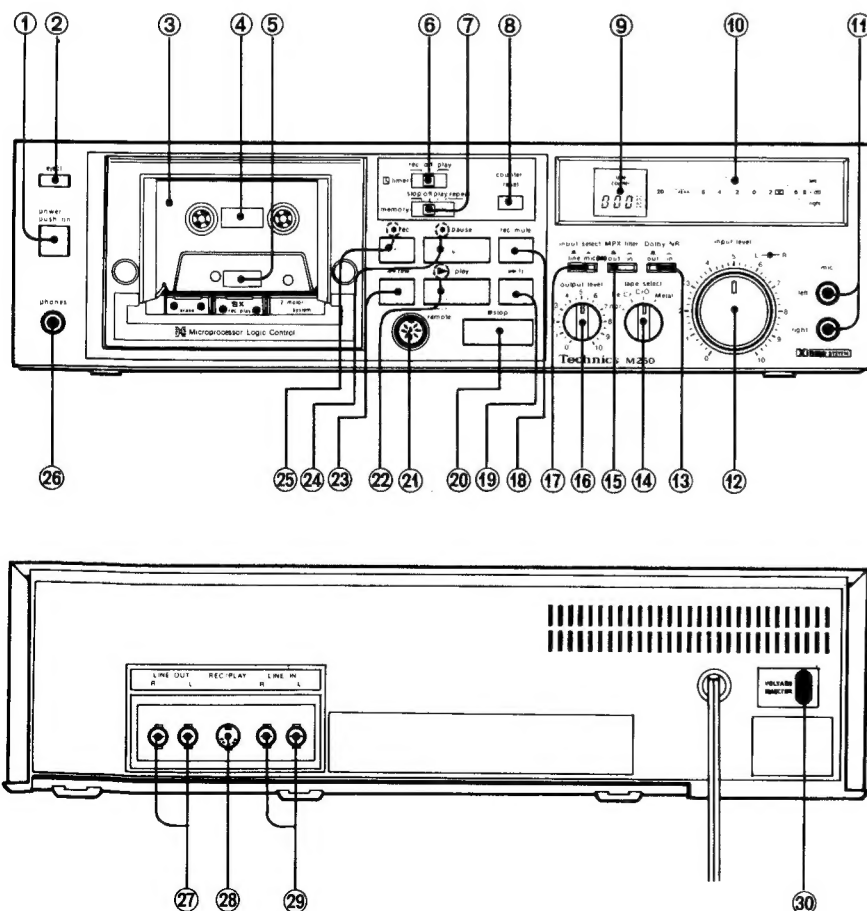
Technics

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LOCATION OF CONTROLS AND COMPONENTS



- ① Power switch [power (push on)]
- ② Eject button (eject)
- ③ Cassette holder
- ④ Remaining tape display light
- ⑤ Head light
- ⑥ Timer start switch [timer (rec-off-play)]
- ⑦ Memory switch [memory (stop-off-play-repeat)]
- ⑧ Reset button (counter reset)
- ⑨ Digital tape counter (tape counter)
- ⑩ FL (fluorescent level) meters
- ⑪ Microphone jacks [mic (left-right)]
- ⑫ Input level controls [input level (L-R)]
- ⑬ Dolby noise reduction switch [Dolby NR (out-in)]
- ⑭ Tape selector [tape select (nor-Fe-Cr-CrO₂-Metal)]
- ⑮ Multiplex filter switch [MPX filter (out-in)]
- ⑯ Output level control (output level)
- ⑰ Input selector [input select (line-mic) (DIN)]
- ⑱ Record-muting button (rec mute)
- ⑲ Fast forward button (ff)
- ⑳ Stop button (stop)
- ㉑ Remote-control connector (remote)
- ㉒ Play button/Playback-indication lamp (play)
- ㉓ Rewind button (rew)
- ㉔ Pause button/Pause-indication lamp (pause)
- ㉕ Record button/Record-indication lamp (rec)
- ㉖ Headphones jack (phones)
- ㉗ Line output jacks (LINE OUT) (R, L)
- ㉘ Record/Playback connection socket (REC/PB)
- ㉙ Line input jacks (LINE IN) (R, L)
- ㉚ Voltage selector (VOLTAGE SELECTOR)

DISASSEMBLY INSTRUCTIONS

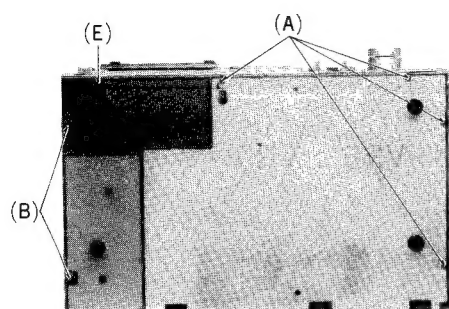


Fig. 1

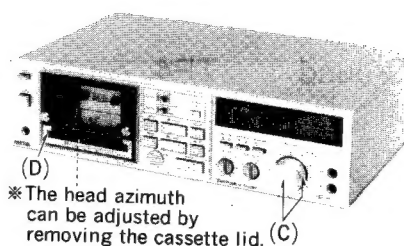


Fig. 2

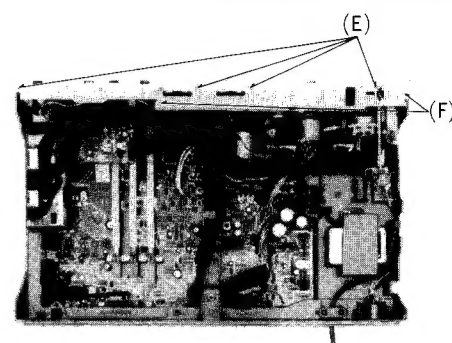


Fig. 3

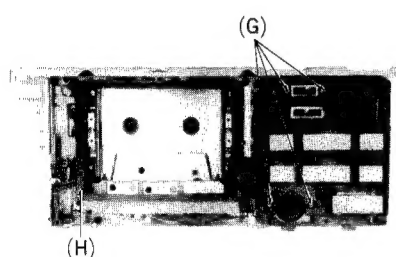


Fig. 4

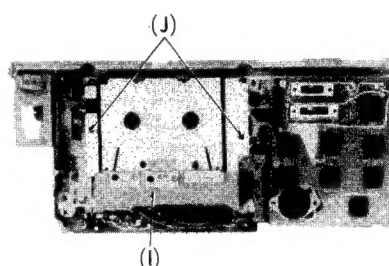


Fig. 5

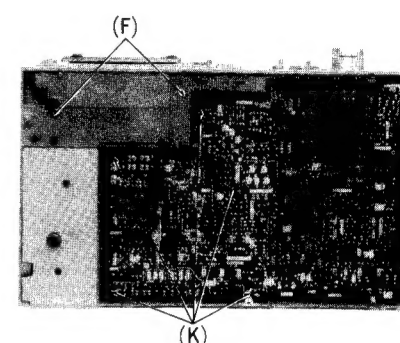


Fig. 6

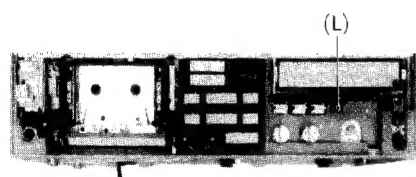


Fig. 7

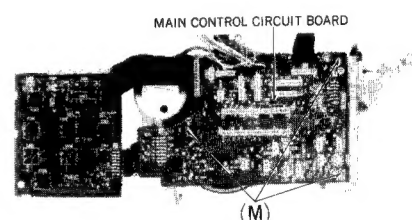


Fig. 8

Ref. No.	Procedure	To remove ———	Remove ———	Shown in fig. ———
1	1	Bottom cover	• 4 screws (A)	1
2	1→2	Case cover	• 2 screws (B)	1
3	1→2→3	Front panel	• 2 control knobs (C) • Cassette lid (D) • 5 screws (E)	2 2 1, 3
4	1→2→3→4	Mechanism unit	• 4 screws (F)	3, 6
5	1→2→3→4→5	Operation button unit	• 4 screws (G)	4
6	1→2→3→4→6	Chassis cover assembly	• Cassette holder (H) • Head cover (I) • 2 screws (J)	4 5 5
7	1→2→3→7	Main circuit board	• 5 screws (K) • Screw (L)	6 7
8	1→2→3→4→8	Control circuit board	• 3 screws (M)	8

MEASUREMENT AND ADJUSTMENT METHODS

CIRCUIT BOARDS AND ADJUSTMENT PARTS LOCATION

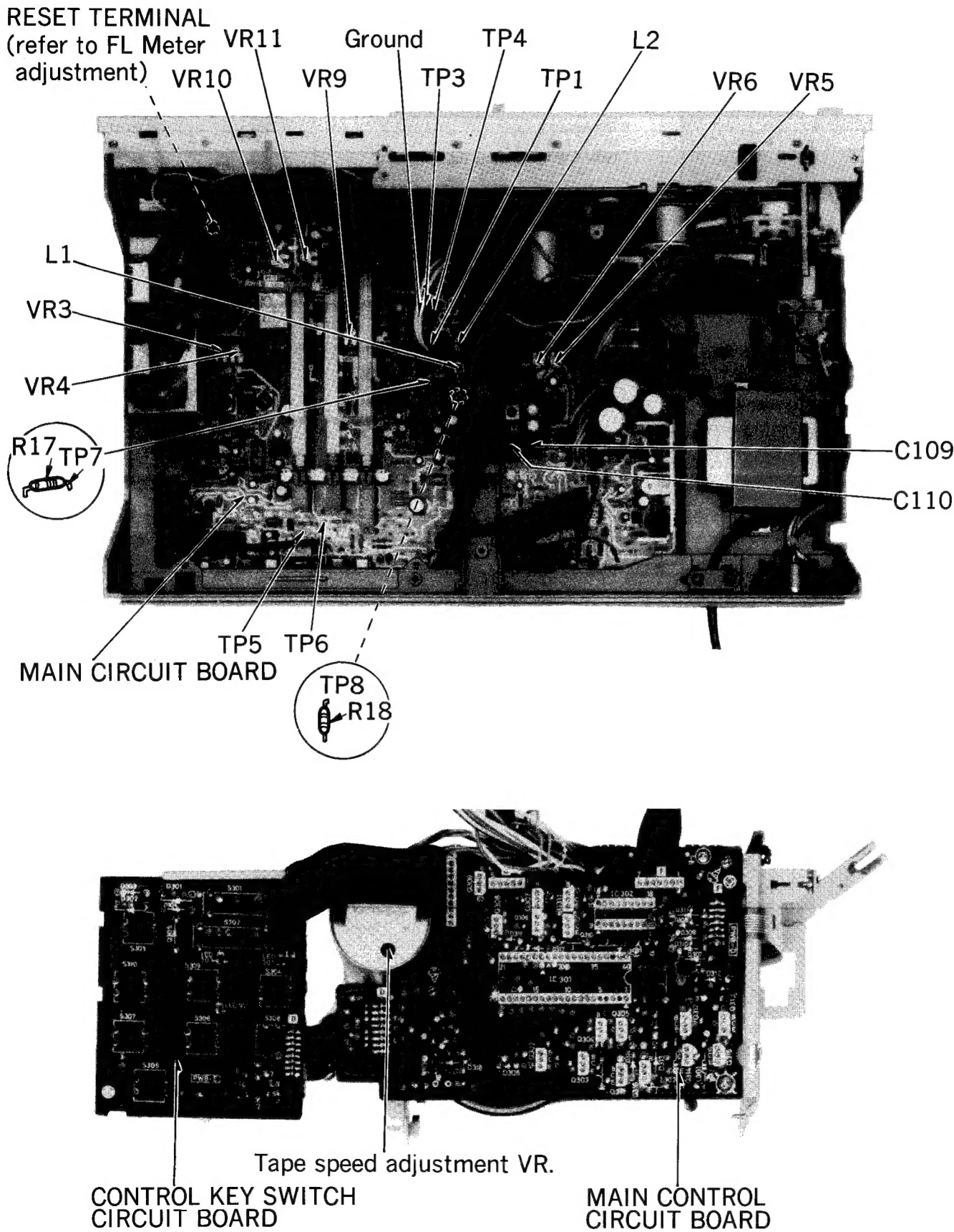
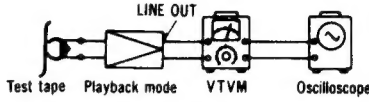

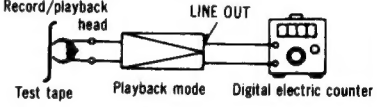
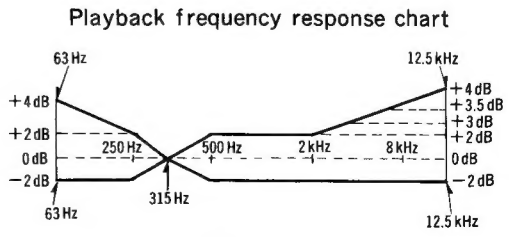


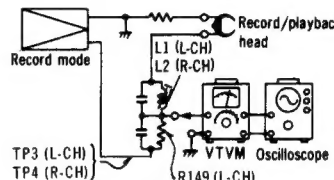
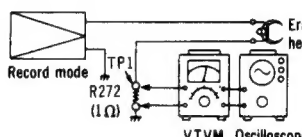
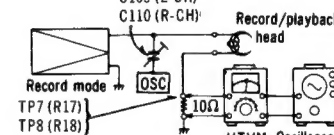
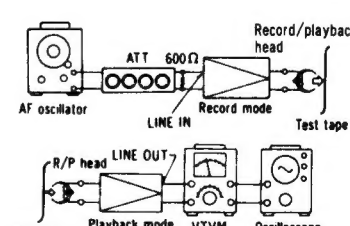
Fig. 1

NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature: $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$)
- Dolby NR switch: OUT
- Tape selector: Normal
- Input selector: Line in

- Timer start switch: OFF
- Memory switch: OFF
- Multiplex filter switch: OUT
- Input level controls: Maximum
- Output level control: Maximum

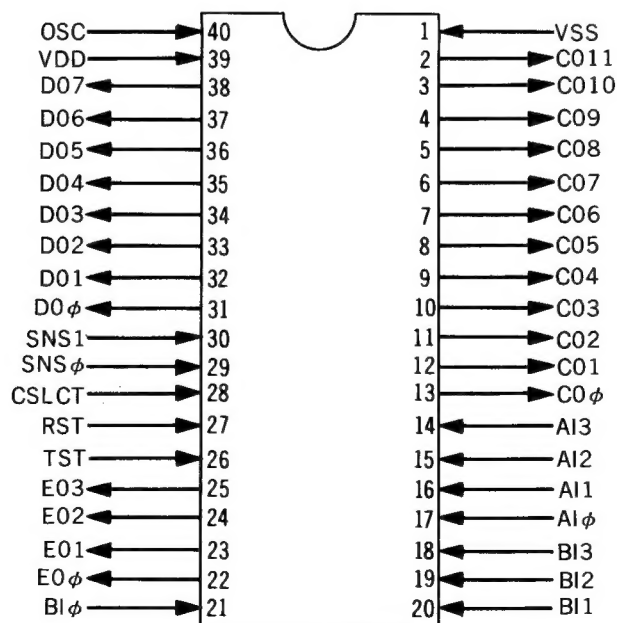
ITEM	MEASUREMENT & ADJUSTMENT
<p>A Head azimuth adjustment</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape (azimuth) ... QZZCFM • Tape path viewer ... QZZCRD 	<p>Record/playback head adjustment</p> <ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 2. 2. Playback azimuth tape (QZZCFM 8 kHz). 3. Adjust record/playback head angle adjustment screw (B) in fig. 3 so that output level at LINE OUT becomes maximum. 4. Measure both channels, and adjust levels for equal output. 5. After adjustment lock head adjustment screw with lacquer.  <p>Fig. 2</p> <p>Erase head adjustment</p> <ol style="list-style-type: none"> 1. Test equipment connection is the same above but use the tape path viewer (QZZCRD) instead of test tape (QZZCFM). 2. Playback this tape. 3. Adjust screw (C) shown in fig. 4 so that the tape may not get curled or malformed by tape guide of the erase head. 4. After adjustment, lock head adjust screw with lacquer.  <p>Fig. 3 Fig. 4</p>
<p>B Tape speed</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode • Tape selector ... Normal position <p>Equipment:</p> <ul style="list-style-type: none"> • Digital electronic counter • Test tape ... QZZCWAT 	<p>Tape speed accuracy</p> <ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 5. 2. Playback test tape (QZZCWAT 3,000 Hz), and supply playback signal to frequency counter. 3. Measure this frequency. 4. On the basis of 3,000 Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%)$ <p style="text-align: center;">where, f = measured value</p> <ol style="list-style-type: none"> 5. Take measurement at middle section of tape. <div style="border: 1px solid black; padding: 5px; text-align: center;"> Standard value: $\pm 1.5\%$ </div> <p>Adjustment method</p> <ol style="list-style-type: none"> 1. Playback the test tape (middle). 2. Adjust so that frequency becomes 3,000 Hz. 3. Tape speed adjustment VR shown in fig. 1. <p>Tape speed fluctuation</p> <p>Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:</p> $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%)$ <p style="text-align: center;">f_1 = maximum value, f_2 = minimum value</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Standard value: Less than 1.0% </div>  <p>Fig. 5</p>
<p>C Playback frequency response</p> <p>Condition:</p> <ul style="list-style-type: none"> • Tape selector ... Normal position • Playback mode <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape ... QZZCFM 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 2. 2. Place UNIT into playback mode. 3. Playback the frequency response test tape (QZZCFM). 4. Measure output level at 12.5 kHz, 8 kHz, 4 kHz, 1 kHz, 250 Hz, 125 Hz and 63 Hz, and compare each output level with the standard frequency 315 Hz, at LINE OUT. 5. Make measurement for both channels. 6. Make sure that the measured value is within the range specified in the frequency response chart. (shown in fig. 6).  <p>Fig. 6</p>

ITEM	MEASUREMENT & ADJUSTMENT
<p>㊦ Playback gain</p> <p>Condition:</p> <ul style="list-style-type: none"> * Tape selector ... Normal position * Playback mode <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * Oscilloscope * Test tape ... QZZCFM 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 2. 2. Playback standard recording level portion on test tape (QZZCFM 315Hz, 0 dB), and using VTVM measure the output level at LINE OUT jack. 3. Make measurement for both channels. <div style="border: 1px solid black; padding: 5px; text-align: center;"> Standard value: $0.7V \pm 1.5dB$ </div> <p>Adjustment</p> <ol style="list-style-type: none"> 1. If measured value is not within standard, adjust VR3 (L-CH), VR4 (R-CH) (shown in fig. 1). 2. After adjustment, check "Playback frequency response" again.
<p>㊦ Bias leakage</p> <p>Condition:</p> <ul style="list-style-type: none"> * Record mode * Input level controls ... MAX * Output level control ... MAX * Tape selector ... Metal position <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * Oscilloscope 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 7. 2. Place UNIT into record mode. 3. Adjust trap coils L1 (L-CH), L2 (R-CH), so that measured value becomes minimum. 4. Make adjustment for both channels.  <p style="text-align: center;">Fig. 7</p>
<p>㊦ Erase current</p> <p>Condition:</p> <ul style="list-style-type: none"> * Tape selector ... Metal position * Record mode <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * Oscilloscope 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 8. 2. Place UNIT into record mode and measure voltage at test point 1. 3. Determine erase current with the following formula: $\text{Erase current (A)} = \frac{\text{Voltage across both ends of R272}}{1 (\Omega)}$ <div style="border: 1px solid black; padding: 5px; text-align: center;"> Standard value: $145 \pm 5 \text{ mA}$ (Tape selector ... Metal) </div> <ol style="list-style-type: none"> 4. If measured value is not within standard, adjust VR9.  <p style="text-align: center;">Fig. 8</p>
<p>㊦ Bias current</p> <p>Condition:</p> <ul style="list-style-type: none"> * Record mode * Tape selector ... Normal position ... Fe-Cr position ... CrO₂ position ... Metal position <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * Oscilloscope 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 9. 2. Place UNIT into record mode, and tape selector to normal position. 3. Read voltage on VTVM and calculate bias current by following formula: $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\Omega}$ <div style="border: 1px solid black; padding: 5px; text-align: center;"> Standard value: around $330\mu\text{A}$ (Normal position) </div> <ol style="list-style-type: none"> 4. Adjust C109 (L-CH) and C110 (R-CH) (shown in fig. 1). 5. Set the tape selector to each position. 6. Make sure that the measured value is within standard. <div style="border: 1px solid black; padding: 5px; text-align: center;"> Standard value: around $370\mu\text{A}$ (Fe-Cr position) around $415\mu\text{A}$ (CrO₂ position) around $700\mu\text{A}$ (Metal position) </div>  <p style="text-align: center;">Fig. 9</p>
<p>㊦ Overall gain</p> <p>Condition:</p> <ul style="list-style-type: none"> * Record/playback mode * Normal position * Input level controls ... MAX * Output level control ... MAX * Standard input level; MIC ... $-72 \pm 3.5 \text{ dB}$ LINE IN ... $-24 \pm 3.5 \text{ dB}$ <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω) * Test tape (reference blank tape) ... QZZCRA for Normal 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 10. 2. Place UNIT into record mode, and normal tape mode. 3. Supply 1 kHz signal (-24 dB) from AF oscillator, through ATT to LINE IN. 4. Adjust ATT until monitor level at LINE OUT becomes 0.7 V. 5. Using test tape, make recording. 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V. 7. If measured value is not 0.7 V, adjust VR5 (L-CH), VR6 (R-CH). 8. Repeat from step 2.  <p style="text-align: center;">Fig. 10</p>

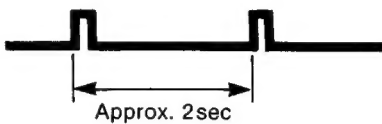

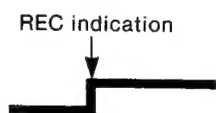
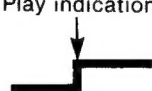
ITEM	MEASUREMENT & ADJUSTMENT
<p>① Fluorescent meter</p> <p>Condition:</p> <ul style="list-style-type: none"> * Record mode * Input level controls ... MAX * Output level control ... MAX * Tape selector ... Normal position <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * AF oscillator * ATT 	<ol style="list-style-type: none"> Test equipment connection is shown in fig. 10. As shown in fig. 11, connect the collector of Q206 and ground. Supply 1 kHz signal (-24 dB) to the LINE IN jack, then press the record button. Adjust the ATT so that the output level at LINE OUT jack becomes 0.7 V (The input level at this condition is termed the standard input level). Adjustment at "-20 dB". <ol style="list-style-type: none"> Adjust the ATT so that input level is -20 dB below standard recording level. Adjust VR11 so that the -20 dB segment lights up in the $-20\text{ dB} \pm 0.8\text{ dB}$ range (L-CH ONLY) (See fig. 12). Adjustment at "0 dB". <ol style="list-style-type: none"> Adjust the ATT so that the output level at LINE OUT jack becomes 0.7 V. (The input level at this condition is termed the standard input level.) Adjust VR10 so that the $+1\text{ dB}$ segment lights up in the $0 \pm 0.2\text{ dB}$ range of the standard input level (See fig. 13). Repeat twice between steps 5 and 6 above. Adjust ATT and check that all segments light up when an input signal level is increased to 10 dB higher than the standard input level (See fig. 14). <div data-bbox="986 353 1444 593" data-label="Diagram"> </div> <div data-bbox="1173 600 1252 627" data-label="Caption">Fig. 11</div> <div data-bbox="938 672 1364 795" data-label="Figure"> </div> <div data-bbox="1117 795 1197 824" data-label="Caption">Fig. 12</div> <div data-bbox="938 828 1364 952" data-label="Figure"> </div> <div data-bbox="1117 952 1197 981" data-label="Caption">Fig. 13</div> <div data-bbox="938 985 1364 1108" data-label="Figure"> </div> <div data-bbox="1117 1108 1197 1137" data-label="Caption">Fig. 14</div>
<p>② Overall frequency response</p> <p>Condition:</p> <ul style="list-style-type: none"> * Record/playback mode * Tape selector ... Normal position ... Fe-Cr position ... CrO₂ position ... Metal position * Input level controls ... MAX * Output level control ... MAX <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * AF oscillator * ATT * Resistor ($600\ \Omega$) * Test tape (reference blank tape) <ul style="list-style-type: none"> ... QZZCRA for Normal ... QZZCRX for CrO₂ ... QZZCRY for Fe-Cr ... QZZCRZ for Metal 	<p>Note: 1</p> <p>Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).</p> <p>Note: 2</p> <p>Test tape QZZCRA to be supplied after July 1980 has higher recording sensitivity in the middle and high frequency range.</p> <div data-bbox="494 1433 1404 1534" data-label="List-Group"> <ul style="list-style-type: none"> * This chart indicates the standard values for the new type of QZZCRA when in use. * This chart indicates the standard values for the former type of QZZCRA when in use. </div> <p>The new type of QZZCRA is marked as shown in fig. 16.</p> <div data-bbox="534 1568 1372 1747" data-label="Image"> </div> <div data-bbox="845 1713 933 1747" data-label="Caption">Fig. 16</div> <div data-bbox="494 1747 877 2038" data-label="List-Group"> <ol style="list-style-type: none"> Test equipment connection is shown in fig. 10. Place the test tape (QZZCRA) in the cassette holder. Place UNIT into record mode, and tape selector to normal position. Supply 1 kHz signal from AF oscillator through ATT to LINE IN. Adjust ATT so that input level is -20 dB below standard recording level (standard recording level = 0 VU). </div> <div data-bbox="893 1142 1412 1400" data-label="Figure"> </div> <div data-bbox="1117 1400 1197 1429" data-label="Caption">Fig. 15</div> <div data-bbox="893 1758 1412 2004" data-label="Figure"> </div> <div data-bbox="1117 2004 1197 2033" data-label="Caption">Fig. 17</div>


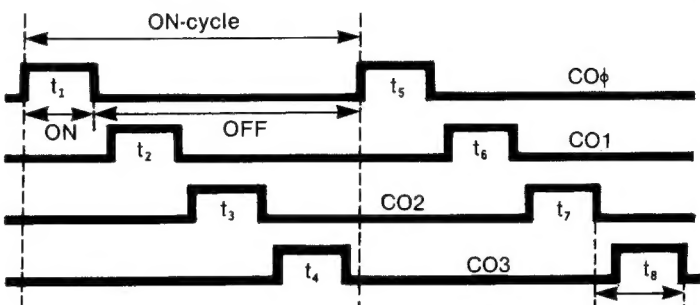

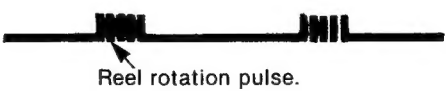

ITEM	MEASUREMENT & ADJUSTMENT
	<p>6. At this time, LINE OUT level indicates 0.07V.</p> <p>7. Record each frequency 30Hz, 100Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12kHz, and 13kHz (14kHz for CrO₂ and Fe-Cr, 16kHz for Metal).</p> <p>8. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1kHz.</p> <p>9. Make sure that the measured value is within the range specified in the overall frequency response chart (shown infig. 15).</p> <p>10. Change test tape to Metal (QZZCRZ), CrO₂ (QZZCRX) and Fe-Cr (QZZCRY).</p> <p>11. Set the tape selector to each position.</p> <p>12. Measure as same as manner above.</p> <p>13. Make sure that the measured value is within the range specified in the overall frequency response chart for Fe-Cr, CrO₂ and Metal tape shown in fig. 17 and 18.</p> <p>14. If measured value is not within standard, adjust C109 (L-CH), C110 (R-CH).</p>
<p>K Dolby NR circuit</p> <p>Condition:</p> <ul style="list-style-type: none"> * Record mode * Input level controls...MAX * Output level control...MAX <p>Equipment:</p> <ul style="list-style-type: none"> * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω) 	<p>Overall frequency response chart (Fe-Cr)</p> <p>Fig. 18</p> <p>1. Test equipment connection is shown in fig. 19.</p> <p>2. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain -34.5dB at TP5 (L-CH), TP6 (R-CH) (frequency 5 kHz).</p> <p>3. Confirm that the value at IN position is $8(\pm 2.5)$ dB greater than the value at OUT position of Dolby NR switch.</p> <p>Fig. 19</p>

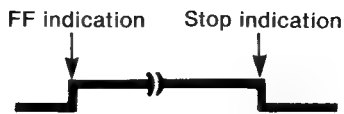
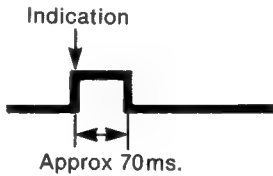
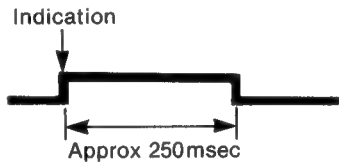

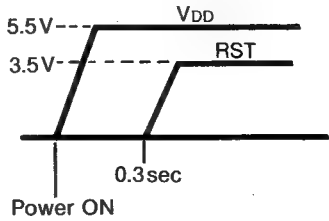
MN1400RS: TERMINATION (BOTTOM VIEW)

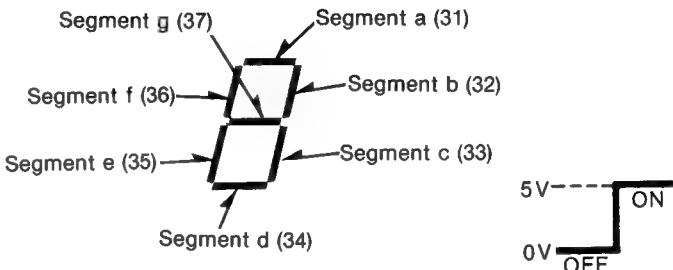
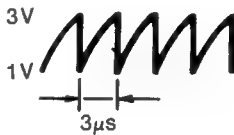


MN1400RS: EACH TERMINAL FUNCTION AND WAVEFORM

Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	No connection	Not used.
3.	CO10	FL meter reset	 <p>Approx. 2sec</p> <p>This output is for resetting the Peak Hold of the FL Meter. The pulse 2.5msec. width is transmitted in approx. 2-second cycles, regardless of the mechanism operation.</p>
4.	CO9	No connection	Not used.
5.	CO8	No connection	Not used.
6.	CO7	Muting	 <p>Power ON</p> <p>In play</p> <p>0.5~0.6sec Muting</p> <p>"L" level 0.5 to 0.6 second after "PLAY" finish. "H" level in PAUSE, FF, REW STOP. "L" level approx. 0.3 second after "REC PAUSE" is switched to REC. "L" level approx. 0.3 second after command in case PAUSE mode is set to REC command.</p>
7.	CO6	REC indication	 <p>REC indication</p> <p>"H" level simultaneously with REC indication. "H" level immediately after power is ON in TIMER REC mode. "H" level held if in TIMER REC position, when STOP AUTO RESET mechanism operates.</p>
8.	CO5	PLAY indication	 <p>Play indication</p> <p>"H" level simultaneously with PLAY indication. Same as the above for TIMER PLAY and STOP AUTO RESET.</p>

Terminal No.	Symbol	Name	Function/operation
9.	CO4	PAUSE indication	<p>Pause indication</p>  <p>"H" level simultaneously with PAUSE indication.</p>
10.	CO3	FL grid & input SW. scan	
11.	CO2	FL grid & input SW. scan	
12.	CO1	FL grid & input SW. scan	
13.	COφ	FL grid & input SW. scan	
14.	Ai3	Input SW read	<p>Each switch is read in accordance with the scans of COφ to 3.</p> <p>STOP SW, MEMORY STOP, TIMER REC and COUNTER RESET are connected to Aiφ. If only STOP SW and MEMORY STOP are closed, their waveforms are as follows;</p>  <p>HALF SW and HALL IC output are connected to Ai3. The waveforms during FF or REW operation are as follows;</p> 
15.	Ai2	Input SW read	
16.	Ai1	Input SW read	
17.	Aiφ	Input SW read	
18.	Bi3	REW key	<p>Push the switch.</p>  <p>"H" in the normal case, "L" when the switch is pushed.</p>
19.	Bi2	FF key	
20.	Bi1	PLAY key	
21.	Biφ	STOP key	
29.	SNSφ	REC key	
30.	SNS1	PAUSE key	

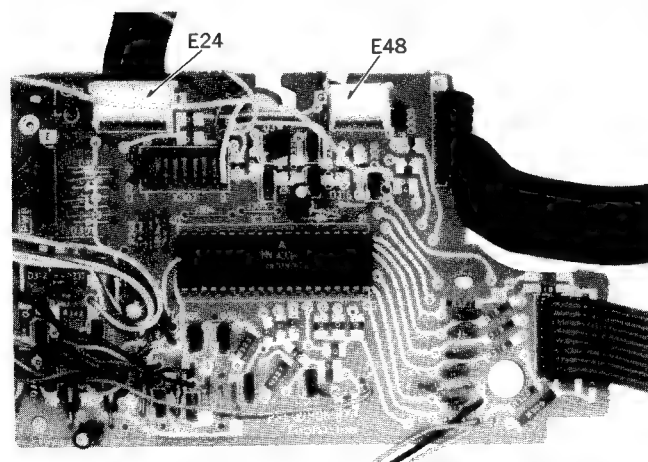
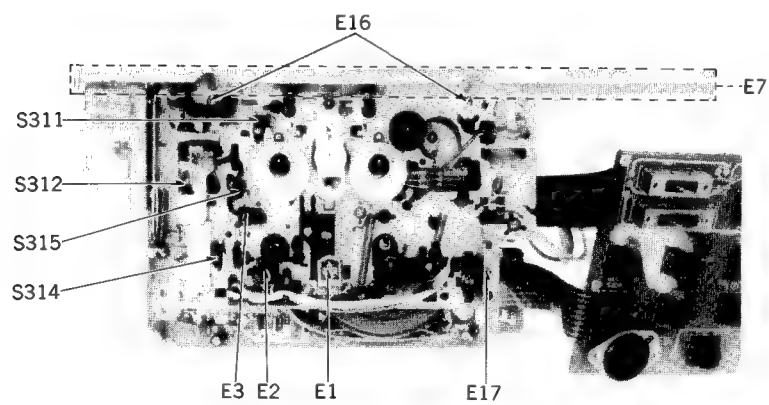
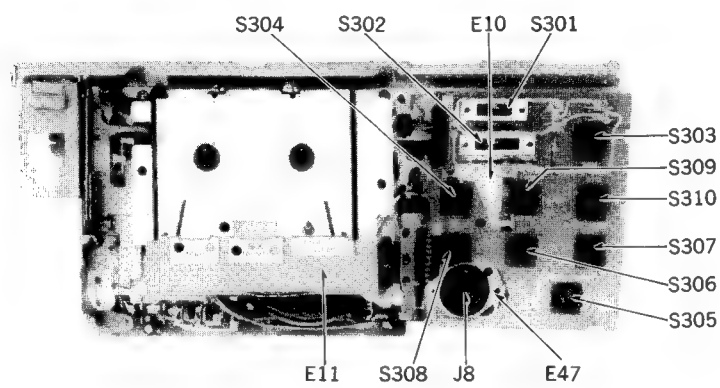
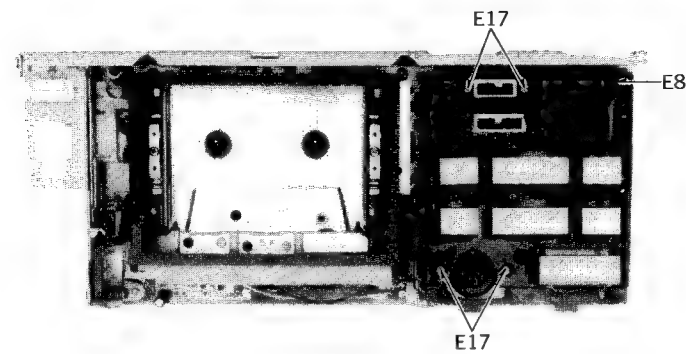
Terminal No.	Symbol	Name	Function/operation
22.	EO ϕ	Brake plunger	 <p>FF indication Stop indication</p> <p>"H" during FF/REW operations.</p>
23.	EO1	Trigger plunger	 <p>Indication</p> <p>Approx 70ms.</p> <p>"H" until MODE SW is closed after the input to switch the mechanism, such as PLAY, PAUSE, STOP, etc. has been applied. (Approx. 70ms. depending on the mechanism condition.)</p>
24.	EO2	Motor CL	 <p>Indication</p> <p>Approx 250msec</p> <p>"H" until MODE SW is changed from "close" to "open" following the indication that the mechanism mode has been changed.</p>  <p>REW indication</p> <p>"H" in REW operation.</p>
25.	EO3	Motor UNCL	Same as the above in MODE conversion. "H" during FF.
26.	TST	Chip test	Connected to GND.
27.	RST	RESET	<p>Computer's RESET terminal. Reset is less than 0.8V.</p>  <p>5.5V--- VDD</p> <p>3.5V--- RST</p> <p>0.3sec</p> <p>Power ON</p>

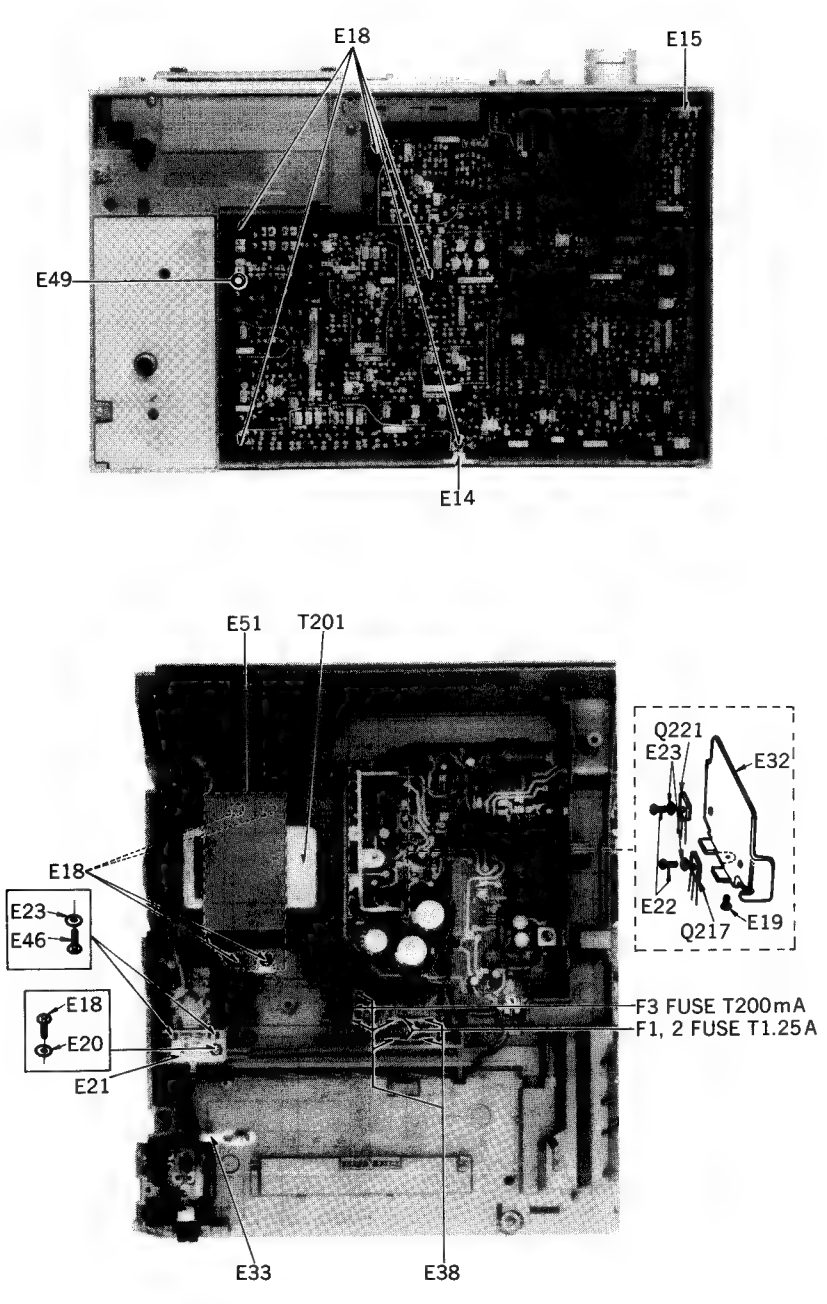
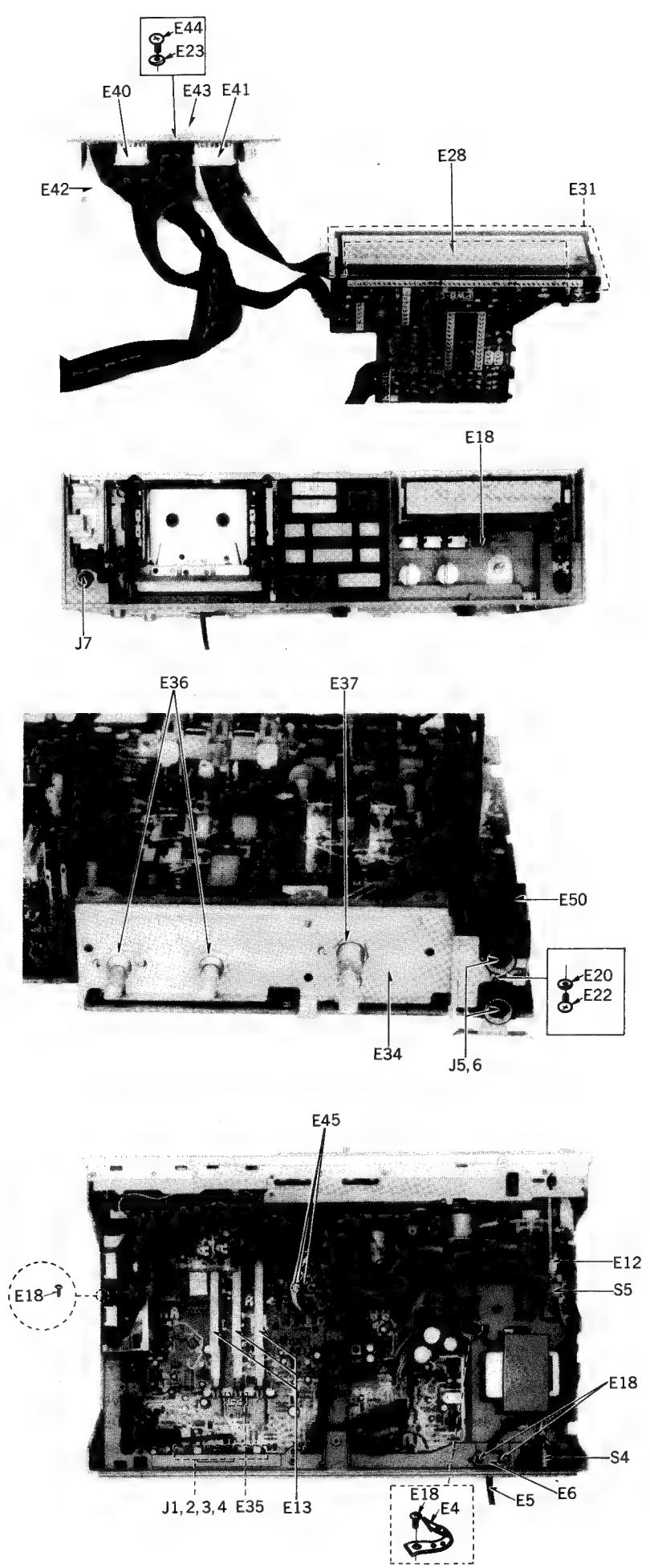
Terminal No.	Symbol	Name	Function/operation
28.	CSLCT	CSLCT	Connected to VDD.
31.	DO ϕ	FL counter Segment a	
32.	DO1	FL counter Segment b	
33.	DO2	FL counter Segment c	
34.	DO3	FL counter Segment d	
35.	DO4	FL counter Segment e	
36.	DO5	FL counter Segment f	
37.	DO6	FL counter Segment g	
38.	DO7	No connection	Not used.
39.	VDD	Power source	Operated at 4.5V to 6.0V.
40.	OSC	Oscillation terminal	 <p>Oscillation is approx. 300kHz. Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements. Use COϕ to 3 in measuring the computer's velocity; Approx. 155Hz in STOP condition.</p>

TROUBLESHOOTING

Fault	Probable cause	Microcomputer terminal to check	Relevant mechanism parts	Relevant external parts
Mechanism does not operate at all. FL not lighting FL lighting OK. (MODE LED not lighting.) MODE indicator lighting OK.	Microcomputer not operating Power not supplied. Clock not oscillating. Reset locked. Microcomputer normal. (Scan normal) Connection to FL Driver. Half SW. closed. Motor circuit faulty.	 39 (VDD) 40 (OSC) 10 to 13 27 (RST) 10 to 13 31 to 37 14 (Ai3) 24, 25	 Half SW. Motor connection	 C310, R347 C309, D317 D311 Q312 to 315
Mechanism defective. FF/REW reverse rotation. FF/REW motor rotating, reel not rotating. CAM continuous rotation in PLAY. Motor rotating in PLAY, but CAM's not switched. Motor rotates in reverse and does not stop after switching to PLAY or PAUSE.	Reverse connection of motor. Brake plunger not being with drawn. MODE SW. defective. Trigger plunger not operating PLAY or STOP SW, defective.	24, 25 22 (EO ϕ) 15 (Ai2) 23 (EO1) 16 (Ai1) 17 (Ai ϕ)	Motor connection Brake plunger disconnection, etc. MODE SW. Trigger plunger STOP PLAY Leaf SW.	 Q313 D310 Q317 D308 D309
REC IND. due not light up. (Operation is normal) PLAY IND. does not light up. PAUSE IND. does not light up. Not counting.	LED or drive transistor defective. -do- -do- Hall IC faulty, buffer circuit faulty.	7 (CO6) 8 (CO5) 9 (CO4) 14 (Ai3)	 Reel magnet	Q305, R324 Q304, R323 Q303, R322 IC303 (Hall IC) Q302, D306
AUTO STOP functioning soon after operation begins. No muting. No peak-resetting. Accidental erase prevention mechanisms not functioning. Operating during EJECT.	Same as the above. (Not counting) Muting output connection etc. Connection Leaf SW Half detection SW.	 6 (CO7) 3 (CO10) 15 (Ai2) 14 (Ai3)	 Accidental erasure Leaf SW Half detection SW.	 D307 D311

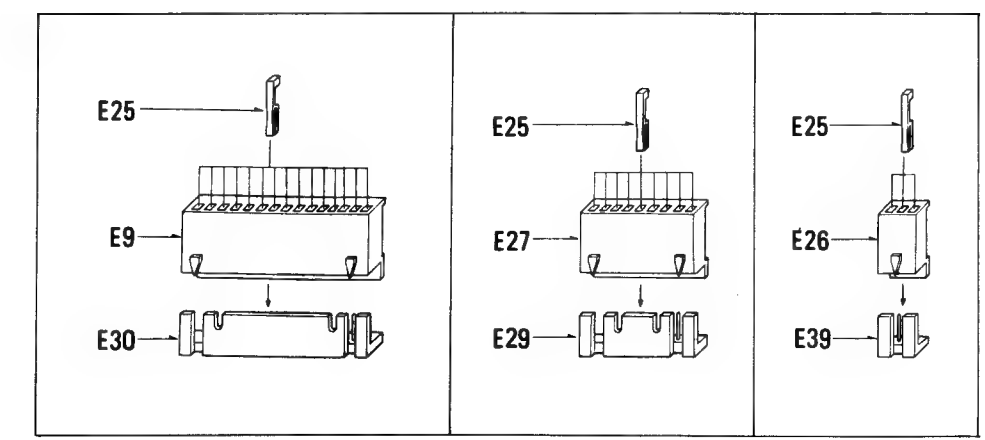
ELECTRICAL PARTS LOCATION





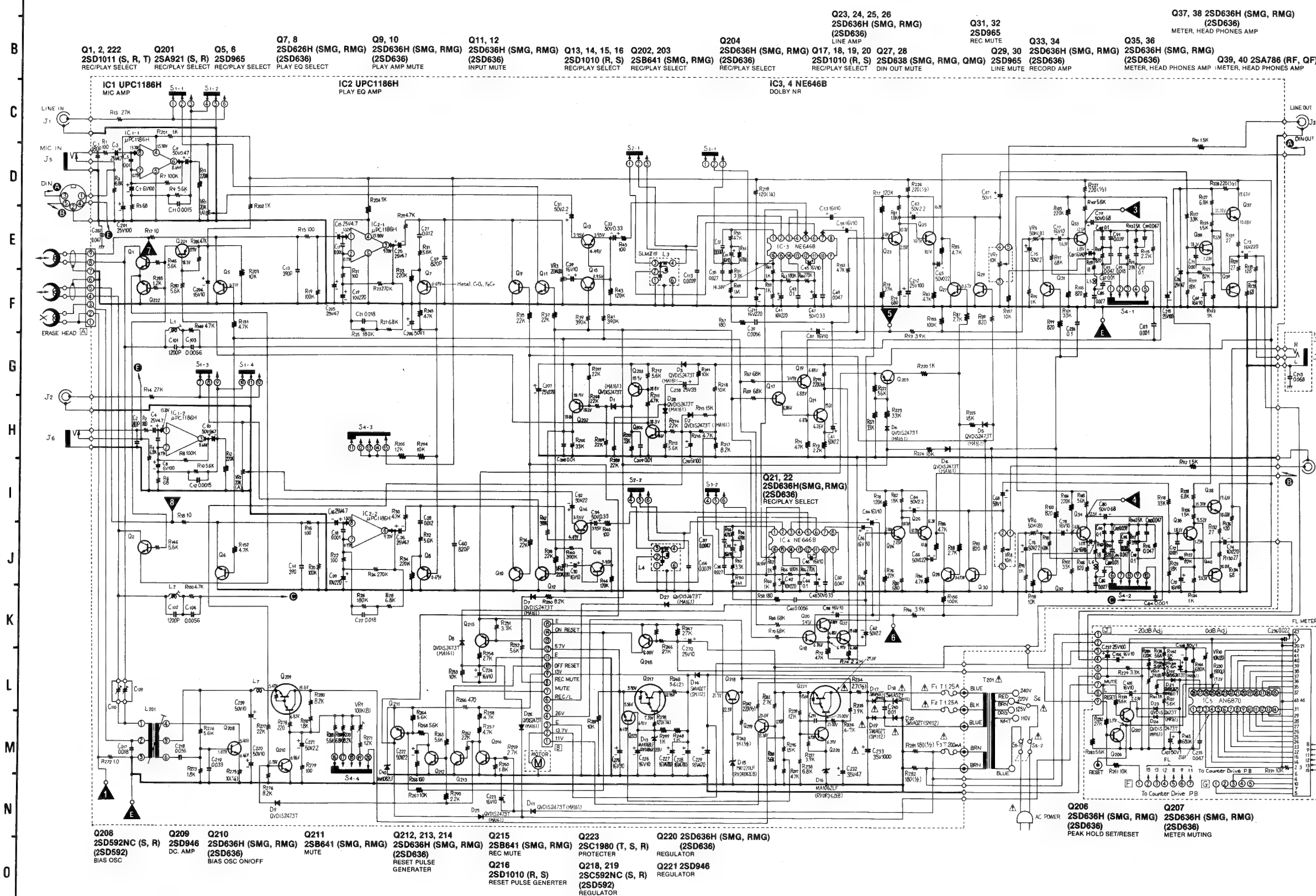
NOTE: Δ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Part Name & Description
ELECTRICAL PARTS		
E1	QWY4123Z	Record/Playback Head
E2	QWY2138Z	Erase Head
E3	XAMQ44S200	Mechanism Pilot Lamp
E4	RME144ZA	Cord Clamper
E5	Δ SJA88	AC Power Cord
*For all European areas except United Kingdom.		
Δ RJA45ZCK		
*For United Kingdom.		
E6	QTD1164	Cord Bushing
E7	QMA3980	Reinforcement Angle
E8	QMA1880	Button Chassis
E9	QJS1925TN	15 Pin Socket
E10	QKJ0418	LED Holder
E11	QGH1091	Head Cover
E12	QMR1888	Power Switch Rod
E13	QMR1889	Switch Rod
E14	QJC0035	Earth Plate-A
E15	QJC0036	Earth Plate-B
E16	XTN3+8B	Screw $\Phi 3 \times 8$
E17	XTN26+6B	Screw $\Phi 2.6 \times 6$
E18	XTN3+12B	Screw $\Phi 3 \times 12$
E19	XTS3+10B	"
E20	XWG3	Washer
E21	QMA3979	Switch Angle
E22	XSN3+8S	Screw $\Phi 3 \times 8$
E23	XWA3B	Washer
E24	QJS1959S	7 Pin Jumper Socket
E25	QJT1054	Contact
E26	QJS1921TN	3 Pin Socket
E27	QJS1923TN	9 Pin Socket
E28	QSF0001F	FL Meter
E29	QJP1923TN	9 Pin Post
E30	QJP1925TN	15 Pin Post
E31	QKJ0417	Meter Holder
E32	QTH1153	Heat Sink
E33	QMF1816	Earth Terminal
E34	QMA3978	Volume Angle
E35	QMA3847	Power Switch Angle
E36	XNS8	Nut
E37	XNS9	"
E38	Δ QTF1054	Fuse Holder
E39	QJP1921TN	3 Pin Post
E40	QJS1961S	5 Pin Jumper Connector
E41	QJS1962S	7 Pin Jumper Connector
E42	QTS1519	Shield Plate
E43	QMA4019	Circuit Board Angle
E44	XSN3+6S	Screw $\Phi 3 \times 6$
E45	QJT1041	Check Pin
E46	XSN3+6S	Screw $\Phi 3 \times 6$
E47	QMF2136	Socket Holder
E48	QJS1958S	5 Pin Jumper Socket
E49	QBK7143	Washer
E50	QTS1523	Microphone Shield Plate
E51	QTS1524	Transformer Shield Plate



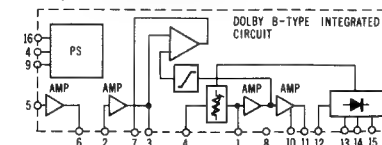
SCHEMATIC DIAGRAM

MAIN AMP CIRCUIT

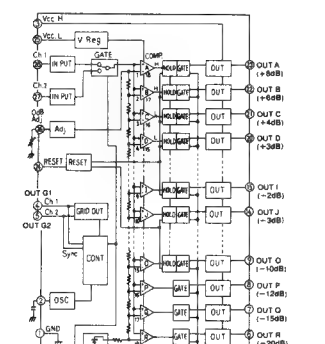


EQUIVALENT CIRCUIT

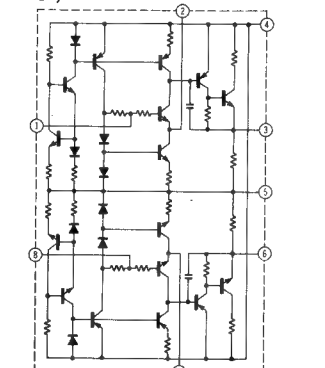
IC3, 4 NE646B



IC5 AN8870

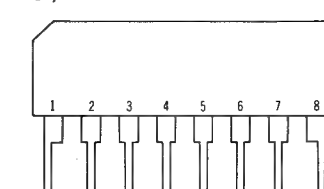


IC1, 2 UPC1186H



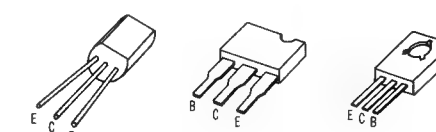
TERMINATION (SIDE VIEW)

IC1, 2 UPC1186H



(BOTTOM VIEW) TRANSISTORS

01.2.5.6.13-20.29-32 07-12.21-28.33-40
201.208.216.218.219 202-207.210-215. 0209.217.221
222.223 220



SPECIFICATIONS

- * Input level controls ... MAX
- * Output level control ... MAX

Playback S/N ratio Test tape ... QZZCFM	Greater than 45 dB
Overall distortion Test tape ... QZZCRA for Normal ... QZZCRX for CrO ₂ ... QZZCRY for Fe-Cr ... QZZCRZ for Metal	Less than 3.5 %
Overall S/N ratio Test tape ... QZZCRA	Greater than 43 dB (without NAB filter)

NOTES:

- S1-1—S1-4 Input select switch (shown in line position).
- S2-1, S2-2 Multiplex filter in/out switch (shown in out position).
- S3-1, S3-2 Dolby in/out select switch (shown in out position).
- S4-1—S4-4 Tape select switch (shown in normal position).
- S5 Power on/off switch (shown in on position).
- S6 AC power voltage select switch.
- VR1, VR2 Input level controls.
- VR3, VR4 Playback gain adjustment VR.
- VR5, VR6 Recording gain adjustment VR.
- VR7, VR8 Output level controls.
- VR9 Erase current adjustment VR.
- VR10 FL meter adjustment VR (for 0dB indication).
- VR11 FL meter adjustment VR (for -20dB indication).
- L1, L2 Bias leakage adjustment coil.
- C109, C110 Bias current adjustment VC.

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
K = 1,000 Ω , M = 1,000 k Ω .
- Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μ F) unless specified otherwise.
- P = Pico-farads.
- The mark (∇) shows test point. e.g. ∇ = test point 1.
- All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position.
- For measurement, use VTM.

CIRCUIT BOARDS

MAIN AMP CIRCUIT BOARD

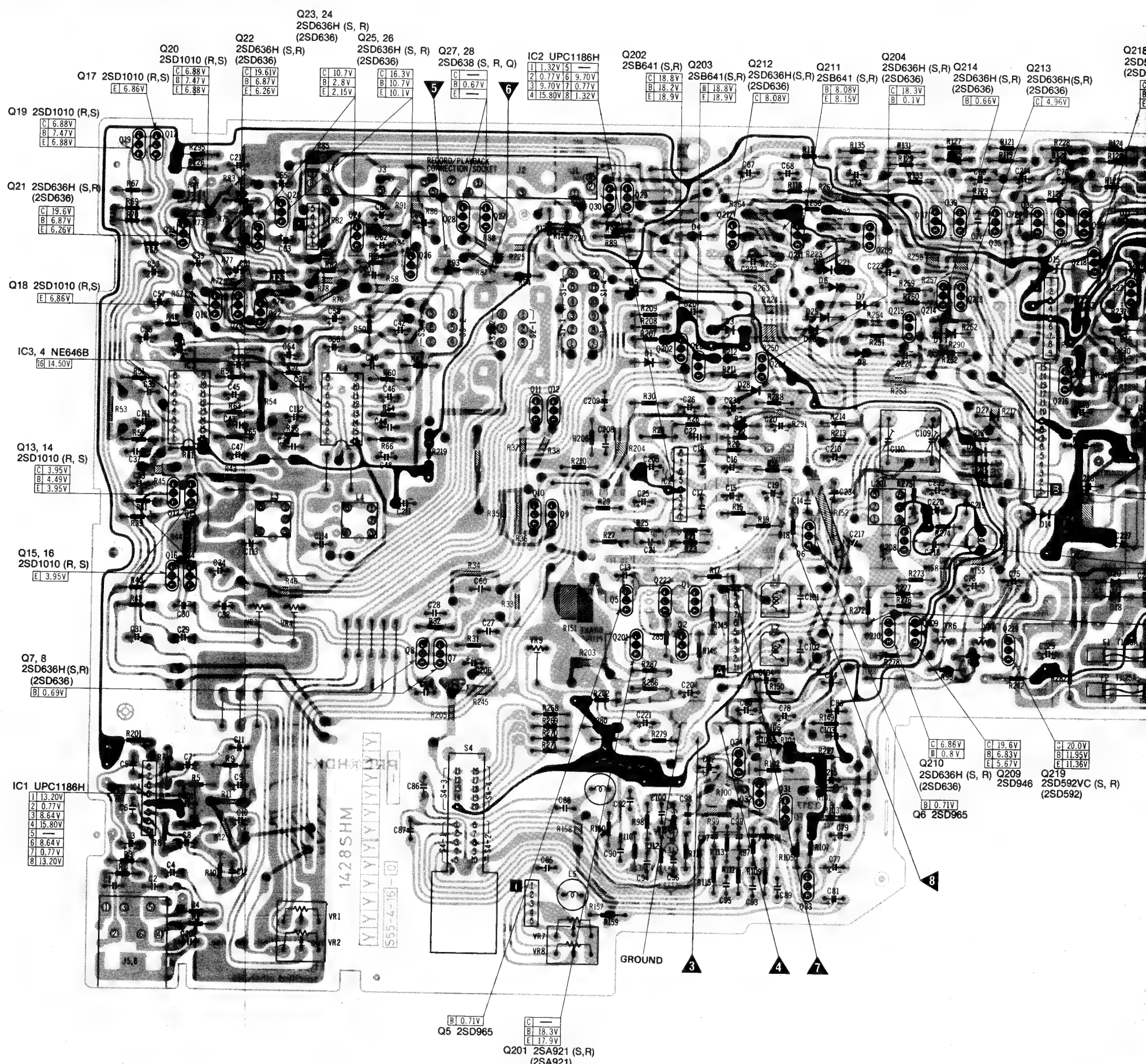
NOTES: RESISTORS
 ERD ... Carbon
 ERG ... Metal-oxide
 ERO ... Metal-film
 ERX ... Metal-film
 ERQ ... Fuse type metallic
 ERC ... Solid
 ERF ... Cement

CAPACITORS
 ECG ... Ceramic
 ECK ... Ceramic
 ECC ... Ceramic
 ECF ... Ceramic
 ECQM ... Polyester film
 ECQE ... Polyester film
 ECQF ... Polypropylene
 ECE ... Electrolytic
 ECEN ... Non polar electrolytic
 ECQS ... Polystyrene
 ECS ... Tantalum

NOTE: Δ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS				VARIABLE CAPACITORS			
R1, 2	ERD25FJ101	R237	ERD25FJ392	C37, 38	ECQM1H472JZ	C109, 110	QVC2121
R3, 4	ERD25FJ682	R238	ERD25FJ682	C39, 40	ECQM1H562JZ	TRANSISTORS	
R5, 6	ERD25FJ680	R239	ERD25FJ123	C41, 42	ECEA1AS221	Q1, 2	2SD1011
R7, 8	ERD25FJ104	R240	ERD25FJ562	C43, 44	ECFDD104KXY	Q5, 6	2SD965
R9, 10	ERD25FJ562	R241	ERD25FJ272	C45, 46	ECEA1HS100	Q7, 8, 9, 10, 11, 12	2SD636
R13, 14	ERD25FJ273	R242	ERG12ANJ221	C47, 48	ECEA502R33	Q13, 14, 15, 16, 17, 18, 19, 20	2SD1010
R15, 16	ERD25FJ101	R243	ERG12ANJ102	C49, 50	ECQM1H473JZ	Q21, 22, 23, 24, 25, 26	2SD636
R17, 18	ERD25FJ100	R244	ERD25FJ273	C53, 54, 55	56, 57, 58	Q27, 28	2SD636
R19, 20	ERD25FJ101	R245	ERX2ANJ586	C59, 60	ECEA1HS100	Q29, 30, 31, 32	2SD636
R21, 22	ERD25FJ104	R246	ERD25FJ332	C61, 62, 63, 64	ECKD1H821K8	Q33, 34, 35	2SD965
R23, 24	ERD25FJ274	R247	ERD25FJ471	C65, 66	ECEA2AS2R2	Q37, 38	2SD636
R25, 26	ERD25FJ104	R248	ERD25FJ272	C67, 68	ECEA502R22	Q39, 40	2SD636
R27, 28	ERD25FJ682	R249	ERD25FJ182	C69, 70	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R29, 30	ERD25FJ472	R250	ERD25FJ562	C71, 72	ECKD1H102MD	Q409, 410, 411, 412, 413, 414, 415, 416	2SA721
R31, 32	ERD25FJ562	R251	ERD25FJ332	C73, 74	ECEA1CS221	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R39, 40, 41, 42	ERD25FJ102	R252	ERD25FJ562	C75, 76	ECEA502R22	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R49, 50	ERD25FJ105	R253	ERD25FJ471	C77, 78	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R51, 52	ERD25FJ332	R254	ERD25FJ182	C79, 80	ECEA502R68	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R55, 56	ERD25FJ473	R255	ERD25FJ182	C81, 82	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R59, 60, 61, 62	ERD25FJ102	R256	ERD25FJ562	C83, 84	ECKD1H102MD	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R63, 64	ERD25FJ104	R257	ERD25FJ562	C85, 86	ECFDD273KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R65, 66	ERD25FJ274	R258	ERD25FJ273	C87, 88	ECFDD103KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R67, 68, 69, 70	ERD25FJ683	R259	ERD25FJ273	C89, 90	ECFDD104KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R79, 80	ERD25FJ681	R260	ERD25FJ182	C91, 92	ECFDD393KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R81, 82	ERD25FJ182	R261	ERD25FJ182	C93, 94	ECFDD473KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R89, 90	ERD25FJ821	R262	ERD25FJ124	C95, 96	ECFDD183KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R93, 94	ERD25FJ392	R263	ERD25FJ122	C97, 98	ECFDD104KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R95, 96	ERD25FJ102	R264	ERD25FJ122	C99, 100	ECFDD473KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R97, 98	ERD25FJ683	R265	ERD25FJ122	C101, 102	ECQF1122JZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R102	ERD25FJ333	R266	ERD25FJ473	C103, 104	ECFDD562KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R105, 106	ERD25FJ821	R267	ERD25FJ562	C105, 106	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R107, 108	ERD25FJ562	R268	ERD25FJ273	C107, 108	ECEA2AS010	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R109, 110	ERD25FJ821	R269	ERD25FJ122	C111, 112	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R111, 112	ERD25FJ392	R270	ERG12ANJ221	C113, 114	ECQM1H392JZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R113, 114	ERD25FJ152	R271	ERG12ANJ153	C201	ECEA1ES101	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R115, 116	ERD25FJ222	R272	ERG12ANJ121P	C202	ECQM1H473KZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R117, 118	ERD25FJ333	R273	ERG12ANJ180	C204	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R119, 120	ERD25FJ183	R274	ERG12ANJ180	C205	ECEA1ES470	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R121, 122	ERD25FJ823	R275	ERG12ANJ180	C206	ECEA2AS011	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R123, 124	ERD25FJ102	R276	ERG12ANJ180	C207	ECEA1ES221	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R125, 126	ERD25FJ152	R277	ERG12ANJ180	C208, 209	ECKD1H103ZF	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R127, 128	ERD25FJ682	R278	ERG12ANJ180	C210	ECEA1AS101	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R129, 130, 131, 132	ERD25FJ682	R279	ERG12ANJ180	C211	ECEA1CS221	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R133, 134	ERD25FJ270	R280	ERG12ANJ180	C212	ECEA1ES101	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R135, 136	ERD25FJ121	R281, 282	ERG12ANJ180	C213	ECQM1H683KZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R137, 138, 139, 140	ERD25FJ121	R282	ERG12ANJ180	C214	ECEA1ES470	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R141, 142	ERD25FJ562	R283	ERG12ANJ180	C215	ECEA1ES101	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R143, 144	ERD25FJ102	R284	ERG12ANJ180	C216	ECQF1183JZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R145, 146	ERD25FJ562	R285	ERG12ANJ180	C217	ECQM1H563KZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R149, 150	ERD25FJ472	R286	ERG12ANJ180	C218	ECQM1H333KZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R153, 154	ERD25FJ472	R287	ERG12ANJ180	C219	ECEA1HF100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R159, 160	ERD25FJ180	R288	ERG12ANJ180	C220	ECEA502R22	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R201, 202	ERD25FJ102	R289	ERG12ANJ180	C221	ECEA2AS2R2	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R206	ERD25FJ333	R290	ERG12ANJ180	C222	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R207, 208, 209	ERD25FJ223	R291	ERG12ANJ180	C223, 224, 225, 226	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R210	ERD25FJ333	R292	ERG12ANJ180	C227, 228	ECEA1CS472	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R211	ERD25FJ473	R293	ERG12ANJ180	C229	ECEA1CS471	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R212, 213	ERD25FJ562	R294	ERG12ANJ180	C230	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R214	ERD25FJ223	R295	ERG12ANJ180	C231	ECKD1H103ZF	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R215	ERD25FJ153	R296	ERG12ANJ180	C232	ECEA1HS470	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R216	ERD25FJ472	R297	ERG12ANJ180	C233	ECEA1VS102	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R218	ERD25FJ103	R298	ERG12ANJ180	C234	ECFDD104KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R219	ERQ14AJ121P	R299	ERG12ANJ180	C235	ECFDD473KXY	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R226, 227, 228	ERD25FJ102	R300	ERG12ANJ180	C236	ECKD1H223ZF	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R229	ERD25FJ332	R301, 302, 303, 304, 305, 306	ERG12ANJ180	C237	ECEA1ES101	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R230	ERQ14AJ151P	R302	ERG12ANJ180	C238	ECEA1VS330	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R231	ERD25FJ103	R303	ERG12ANJ180	C239	ECEA1VS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R234	ERQ12AJ2R7P	R304	ERG12ANJ180	C240	ECEA1HS100	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R235	ERD25FJ392	R305	ERG12ANJ180	C301, 302, 303, 304, 305, 306	ECKD1H103ZF	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
R236	ERD25FJ472	R306	ERG12ANJ180	C307	ECEA1HS470	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
		R307	ERG12ANJ180	C308	ECEA16N10	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
		R308	ERG12ANJ180	C309	ECEA1HSR1	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
		R309	ERG12ANJ180	C310	ECCD1H331KD	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965
		R310	ERG12ANJ180	C311, 312	ECKD1H102MD	Q401, 402, 403, 404, 405, 406, 407, 408	2SD965

Ref. No.	Part No.	Part Name & Description
TRANSFORMER		
T201	Δ QLPD49ELC	AC Power Transformer
COILS		
L1, 2	QLQM0333	Bias Trap Coil
L3, 4	SLM1219	MPX Filter
L5, 6, 7	QLQX0332K	Peaking Coil
L201	QLB0198K	Bias Oscillation Coil
L301, 302	QLQZ1014D	Choke Coil
L303	ELH101KA	Choke Coil
SWITCHES		
S1, 2, 3	QSWY304	Push Switch
S4	QSR4404	Rotary Switch
S5	Δ QSW2214	Push Switch (Power ON/OFF)
S6	Δ QSR1407H	Rotary Switch (Voltage Selector)
S301	QSS1302	Slide Switch (Timer Switch)
S302	QSS1401	Slide Switch (Memory Switch)
S303, 304, 305, 306, 307, 308, 309, 310	EVQPAR11K	Key Board Switch
S311	QSB0260	Leaf Switch (Erase Safety Switch)
S312	QSB0261	Leaf Switch (Stop Switch)
S313, 314	QSB0260	Leaf Switch (Playback Switch)
S315	QSB0261	Leaf Switch (Cassette Half Detector)
FUSES		
F1, 2	Δ XBAQ125028	Fuse (T 1.25A)
F3	Δ XBAQ0013	Fuse (T 200mA)
JACKS		
J1, 2, 3, 4	QEJ5002S	Jack Board Assembly
J5, 6	QJA0257H	Microphone Jack
J7	QJA0249H	Headphones Jack
J8	QJS1960S	8 Pin Socket



CIRCUIT BOARDS

MAIN AMP CIRCUIT BOARD

NOTES: RESISTORS

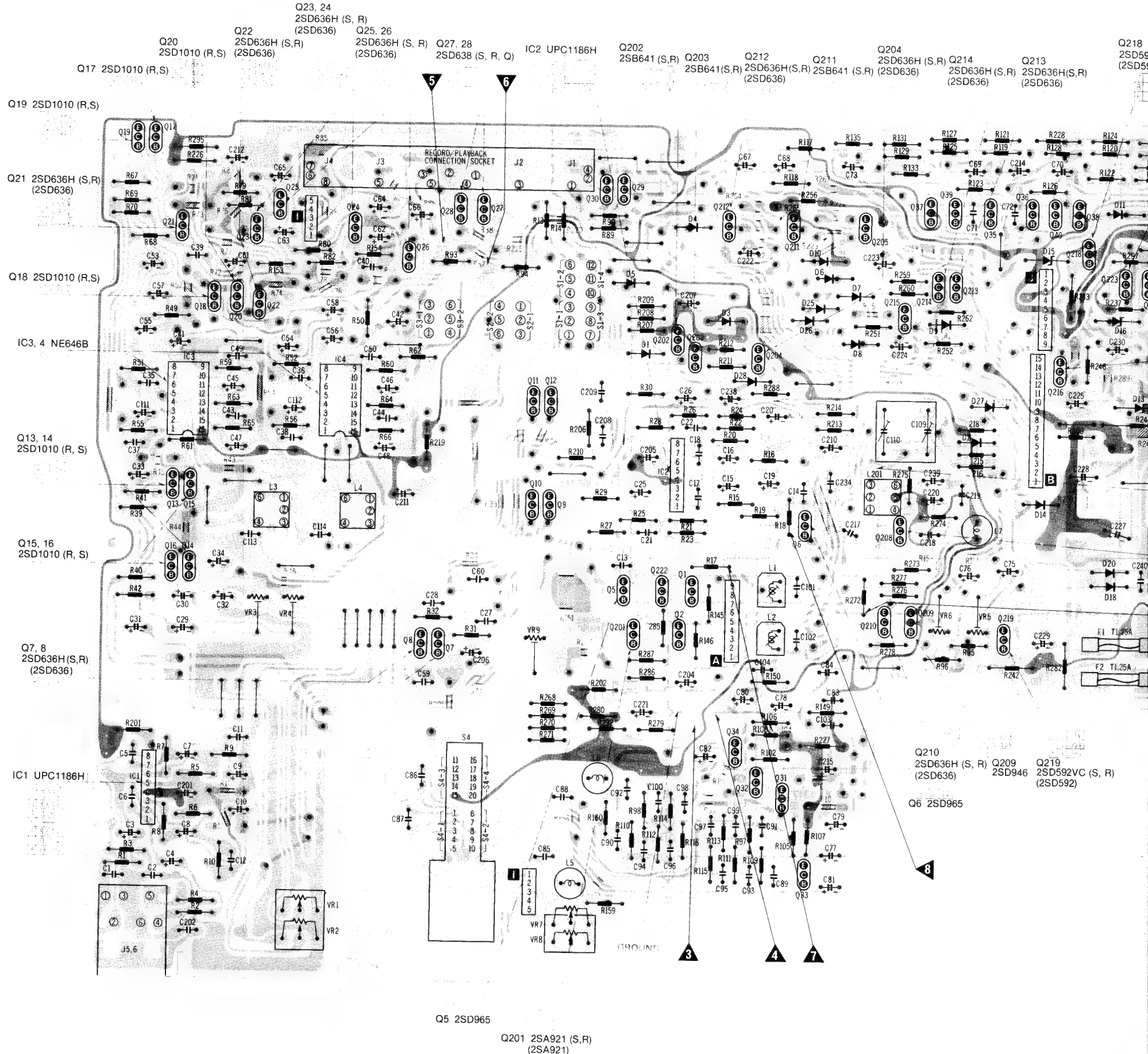
ERD ... Carbon
ERG ... Metal-oxide
ERO ... Metal-film
ERX ... Metal-film
ERQ ... Fuse type metallic
ERC ... Solid
ERF ... Cement

CAPACITORS

ECG ... Ceramic
ECK ... Ceramic
ECC ... Ceramic
ECF ... Ceramic
ECQM ... Polyester film
ECQE ... Polyester film
ECQF ... Polypropylene
ECE ... Electrolytic
ECE□ ... Non polar electrolytic
ECQS ... Polystyrene
ECS ... Tantalum

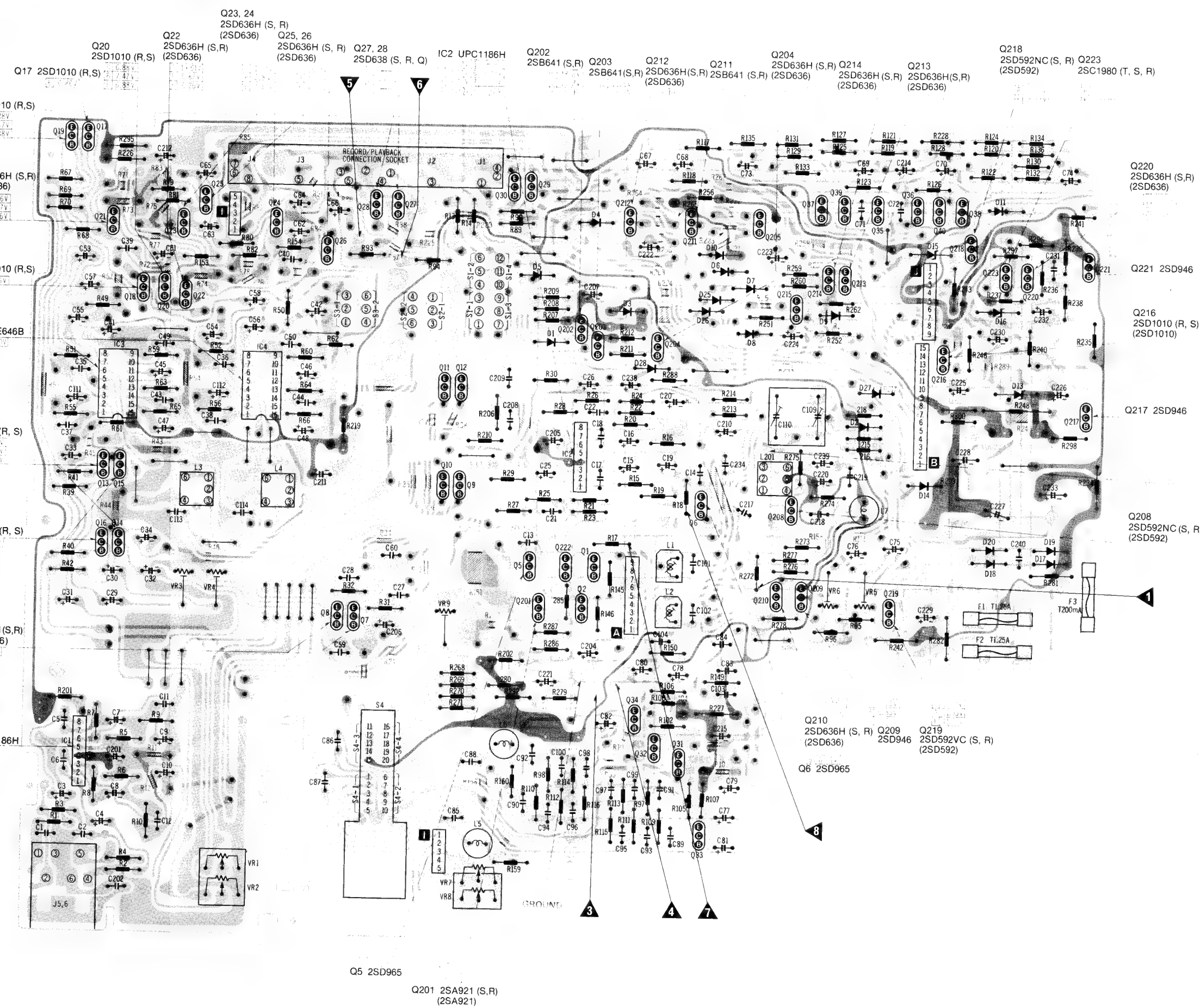
NOTE: Δ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS				VARIABLE CAPACITORS			
R1, 2	ERD25FJ101	R237	ERD25FJ392	C37, 38	ECQM1H47J2J	C109, 110	QVC2121
R3, 4	ERD25FJ682	R238	ERD25FJ682	C39, 40	ECQM1H562JZ	TRANSISTORS	
R5, 6	ERD25FJ680	R239	ERD25FJ123	C41, 42	ECEA1AS221	Q1, 2	2SD1011
R7, 8	ERD25FJ104	R240	ERD25FJ562	C43, 44	ECFDD104KXY	Q5, 6	2SD965
R9, 10	ERD25FJ562	R241	ERD25FJ272	C45, 46	ECEA1HS100	Q7, 8, 9, 10, 11, 12	2SD636
R13, 14	ERD25FJ273	R242	ERG12ANJ221	C47, 48	ECEA50Z8R33	Q13, 14, 15, 16, 17, 18, 19, 20	2SD1010
R15, 16	ERD25FJ101	R243	ERG12ANJ102	C49, 50	ECQM1H47J3J	Q21, 22, 23, 24, 25, 26	2SD636
R17, 18	ERD25FJ100	R244	ERD25J1273	C53, 54, 55, 56, 57, 58	ECEA1HS100	Q27, 28	2SD636
R19, 20	ERD25FJ100	R245	ERX2ANJ586	C59, 60	ECKD1H821K8	Q29, 30, 31, 32	2SD965
R21, 22	ERD25FJ101	R251	ERD25FJ332	C61, 62, 63, 64	ECEA2AS2R2	Q33, 34, 35, 36, 37, 38	2SD636
R23, 24	ERD25J274	R252	ERD25FJ562	C65, 66	ECEA50Z8R22	Q39, 40	2SA786
R25, 26	ERD25J104	R256	ERD25FJ471	C67, 68	ECEA2AS010	Q201	2SA921
R27, 28	ERD25FJ682	R259	ERD25J272	C69, 70	ECEA1HS100	Q202, 203	2SB641
R29, 30	ERD25FJ472	R260	ERD25J182	C71, 72	ECKD1H102MD	Q204	2SD636
R31, 32	ERD25FJ562	R262	ERD25J223	C73, 74	ECEA1CS221	Q205	2SB641
R39, 40, 41, 42	ERD25J394	R268	ERD25FJ562	C75, 76	ECEA50Z8R2	Q206, 207	2SD636
R49, 50	ERD25J105	R269	ERD25FJ682	C77, 78	ECEA1HS100	Q208	2SD592NCS
R51, 52	ERD25FJ332	R270	ERD25J153	C79, 80	ECEA50Z8R68	Q209	2SD946
R55, 56	ERD25J1473	R271	ERD25J1273	C81, 82	ECEA1HS100	Q210	2SD636
R59, 60, 61, 62	ERD25FJ102	R272	ERD25FJ180	C83, 84	ECKD1H102MD	Q211	2SB641
R63, 64	ERD25J104	R273	ERD25FJ182	C85, 86	ECFDD273KXY	Q212, 213, 214	2SD636
R65, 66	ERD25J274	R274	ERD25FJ562	C87, 88	ECFDD103KXY	Q215	2SB641
R67, 68, 69, 70	ERD25J683	R275	ERQ14AJ100P	C89, 90	ECFDD104KXY	Q216	2SD1010
R79, 80	ERD25FJ681	R276	ERD25FJ822	C91, 92	ECFDD393KXY	Q217	2SD946
R81, 82	ERD25FJ182	R277	ERD25J223	C93, 94	ECFDD473KXY	Q218, 219	2SD592NCS
R89, 90	ERD25FJ821	R281, 282	ERG12ANJ181	C95, 96	ECFDD183KXY	Q220	2SD636
R93, 94	ERD25FJ392	R284	ERD25J124	C97, 98	ECFDD104KXY	Q221	2SD946
R95, 96	ERD25FJ102	R285	ERD25FJ122	C99, 100	ECFDD473KXY	Q222	2SD1011
R97, 98	ERD25J683	R286	ERD25J473	C101, 102	ECQP1122JZ	Q223	2SC1980
R102	ERD25J333	R287	ERD25FJ562	C103, 104	ECFDD562KXY	Q302	2SB641
R105, 106	ERD25FJ821	R288	ERD25J223	C105, 106	ECEA1HS100	Q303, 304, 305	2SD636
R107, 108	ERD25FJ562	R289	ERD25J182	C107, 108	ECEA2AS010	Q306	2SD637
R109, 110	ERD25FJ821	R292	ERD25FJ182	C111, 112	ECEA1HS100	Q307	2SB642
R111, 112	ERD25FJ392	R295	ERG12ANJ221	C113, 114	ECQM1H392JZ	Q308	2SD637
R113, 114	ERD25FJ152	R296	ERD25J153	C201	ECEA1ES101	INTEGRATED CIRCUITS	
R115, 116	ERD25FJ222	R297	ERD25FJ472	C202	ECQM1H473KZ	IC1, 2	UPC1186H
R117, 118	ERD25J333	R298	ERD25AJ121P	C204	ECEA1HS100	IC3, 4	NE646B
R119, 120	ERD25J183	R337	ERD25FJ180	C205	ECEA1ES470	IC5	AN6870
R121, 122	ERD25J823	R340	ERD25FJ180	C206	ECEA2AS010	IC301	MN1400RS
R123, 124	ERD25FJ102	R347	ERD25J153	C207	ECEA1ES221	IC303	DN6838
R125, 126	ERD25FJ152	R348	ERD25J273	C208, 209	ECKD1H103ZF	TRANSFORMER	
R127, 128	ERD25FJ682	R349	ERD25J563	C210	ECEA1AS101	T201	Δ QLPD49ELC
R129, 130, 131, 132	ERD25FJ270	R356, 357, 358, 359, 360, 361, 362, 363	ERD10TJ473	C211	ECEA1CS221	COILS	
R133, 134	ERD25FJ680	R362, 363	ERD10TJ473	C212	ECEA1ES101	L1, 2	QLQM0333
R135, 136	ERD25FJ121	R401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424	ERD25J473	C213	ECQM1H683KZ	L3, 4	SLM1Z19
R137, 138, 139, 140	ERD25FJ562	R409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424	ERD25J473	C214	ECEA1ES470	L5, 6, 7	QLQX0332K
R141, 142	ERD25FJ102	R419, 420, 421, 422, 423, 424	ERD25J472	C215	ECEA1ES101	L201	QLB0198K
R143, 144	ERD25J684	R423, 224, 225, 226	ERD25J472	C216	ECQP1183JZ	L301, 302	QLQZ1014D
R145, 146	ERD25FJ562	R427, 228	ERD25J472	C217	ECQM1H563KZ	L303	ELEH101KA
R149, 150	ERD25FJ472	R429	ERD25J472	C218	ECQM1H333KZ	SWITCHES	
R153, 154	ERD25FJ472	R430	ERD25J472	C219	ECQM1H333KZ	S1, 2, 3	QSWY304
R159, 160	ERD25FJ180	R431	ERD25J472	C220	ECEA1HS100	S4	QSR4404
R201, 202	ERD25FJ102	R432	ERD25J472	C221	ECEA1CS472	S5	Δ QSW2214
R206	ERD25J333	R433	ERD25J472	C222	ECEA50Z8R22	S6	Δ QSR1407H
R207, 208, 209	ERD25J223	R434	ERD25J472	C223	ECEA2AS2R2	S301	QSS1302
R210	ERD25J223	R435	ERD25J472	C224	ECEA1HS100	S302	QSS1401
R211	ERD25J473	R436	ERD25J472	C225	ECEA1HS100	S303, 304, 305, 306, 307, 308, 309, 310	EVQPAR11K
R212, 213	ERD25FJ562	R437	ERD25J472	C226	ECEA1HS100	S311	QSB0260
R214	ERD25J223	R438	ERD25J472	C227	ECEA1HS100	S312	QSB0261
R215	ERD25J153	R439	ERD25J472	C228	ECEA1HS100	S313, 314	QSB0260
R216	ERD25FJ472	R440	ERD25J472	C229	ECEA1HS100	S315	QSB0261
R218	ERD25FJ103	R441	ERD25J472	C230	ECEA1HS100	FUSES	
R219	ERQ14AJ121P	R442	ERD25J472	C231	ECKD1H103ZF	F1, 2	Δ XBAQ125028
R226, 227, 228	ERG12ANJ221	R443	ERD25J472	C232	ECEA1HS470	F3	Δ XBAQ0013
R229	ERD25FJ332	R444	ERD25J472	C233	ECEA1VS102	JACKS	
R230	ERQ14AJ151P	R445	ERD25J472	C234	ECFDD104KXY	J1, 2, 3, 4	QEJ5002S
R231	ERD25FJ103	R446	ERD25J472	C235	ECFDD473KXY	J5, 6	QJA0257H
R234	Δ ERQ12AJ2R7P	R447	ERD25J472	C236	ECKD1H123ZF	J7	QJA0249H
R235	Δ ERD25FJ392	R448	ERD25J472	C237	ECEA1ES101	J8	QJS1960S
R236	Δ ERD25FJ472	R449	ERD25J472	C238	ECEA1VS330		
		R450	ERD25J472	C239	ECFWD102KXY		
		R451	ERD25J472	C240	ECEA1AS221		
		R452	ERD25J472	C241	ECKD1H103ZF		
		R453	ERD25J472	C242	ECEA1HS100		
		R454	ERD25J472	C243	ECEA50MR33R		
		R455	ERD25J472	C244	ECQM1H273JZ		

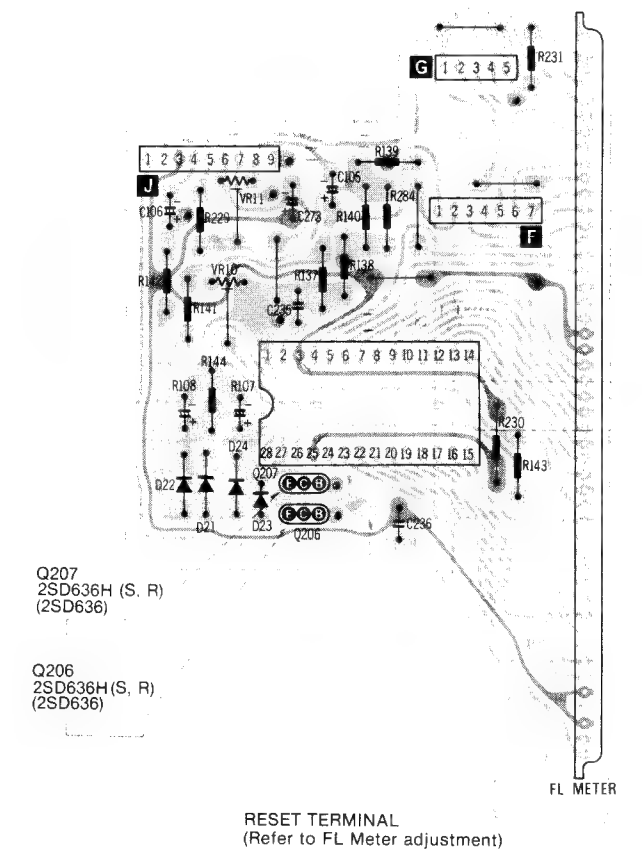


CIRCUIT BOARDS

N AMP CIRCUIT BOARD



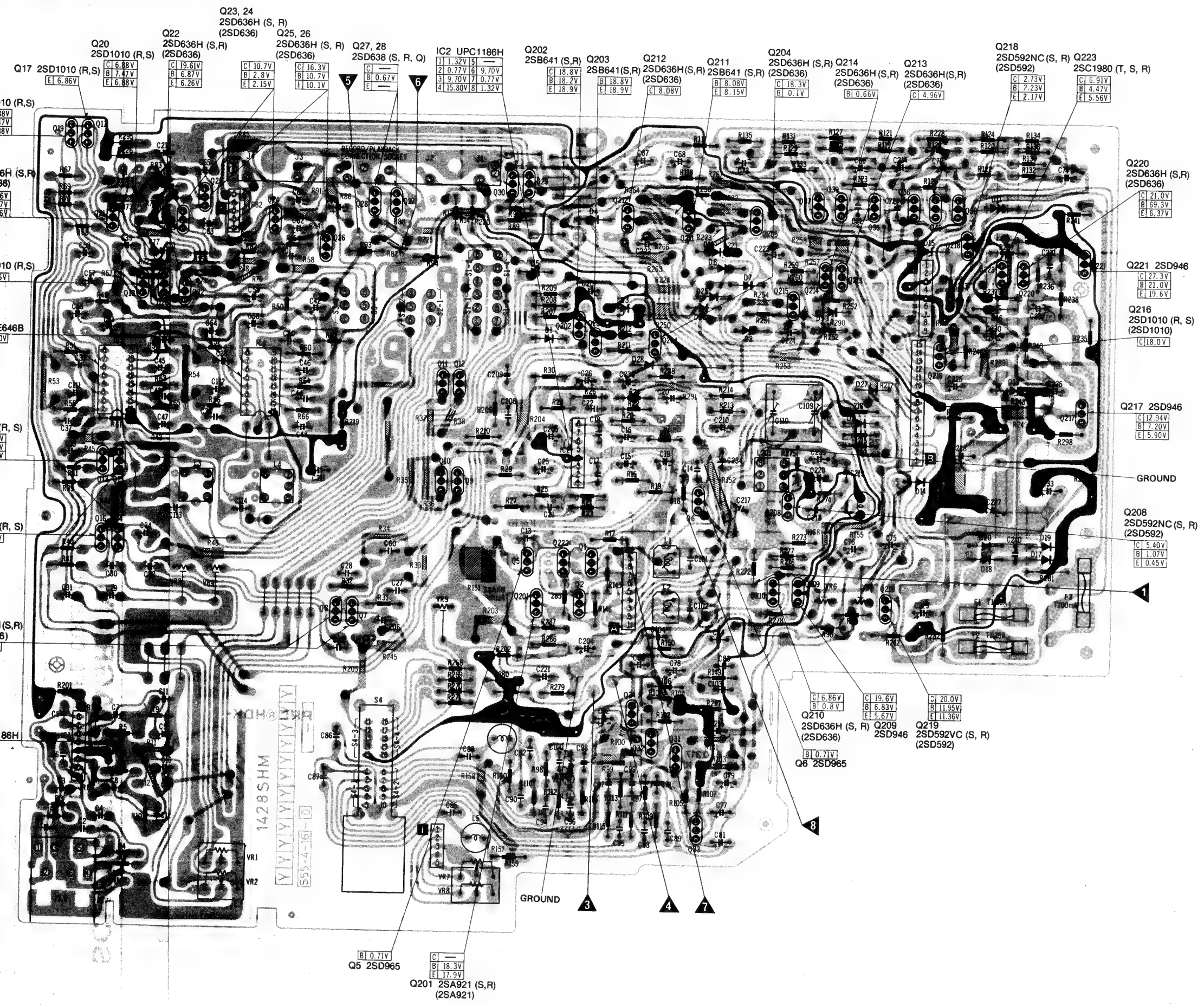
FL METER CIRCUIT BOARD



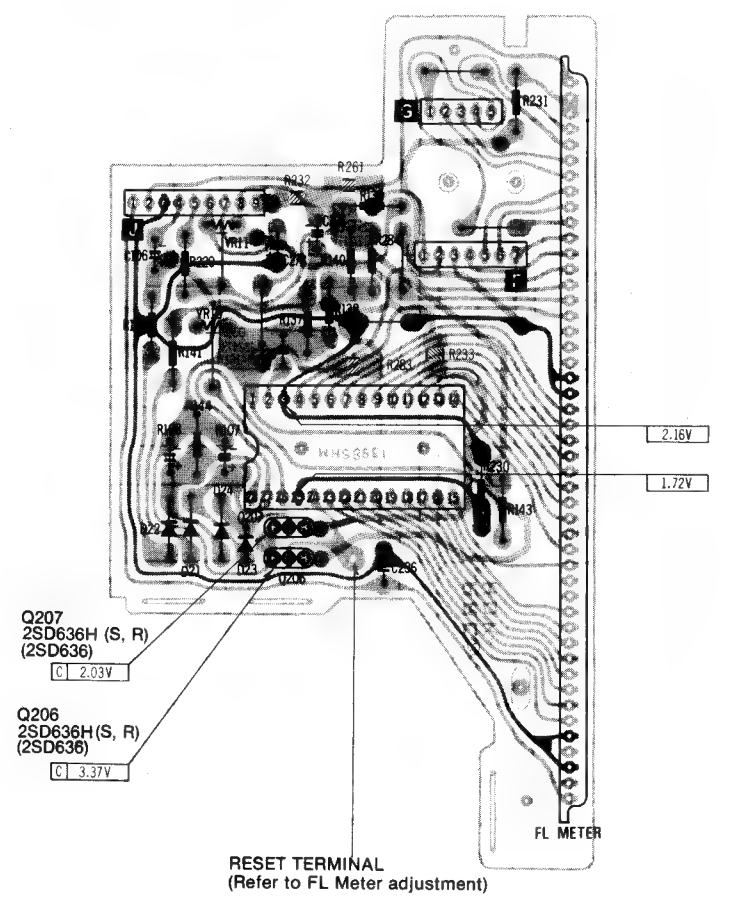
- NOTES:**
- The circuit shown in on the conductor is +B (bias) circuit.
 - The circuit shown in on the conductor indicates printed circuit, which is included printed type resistors.
 - The circuit shown in on the conductor indicates printed circuit on the back side of the printed circuit board.
 - The symbols (*) indicate connection points between conductors on the front side and back side of the circuit board.
 - Values indicated in are DC voltage between the ground and electrical parts.

CIRCUIT BOARDS

N AMP CIRCUIT BOARD

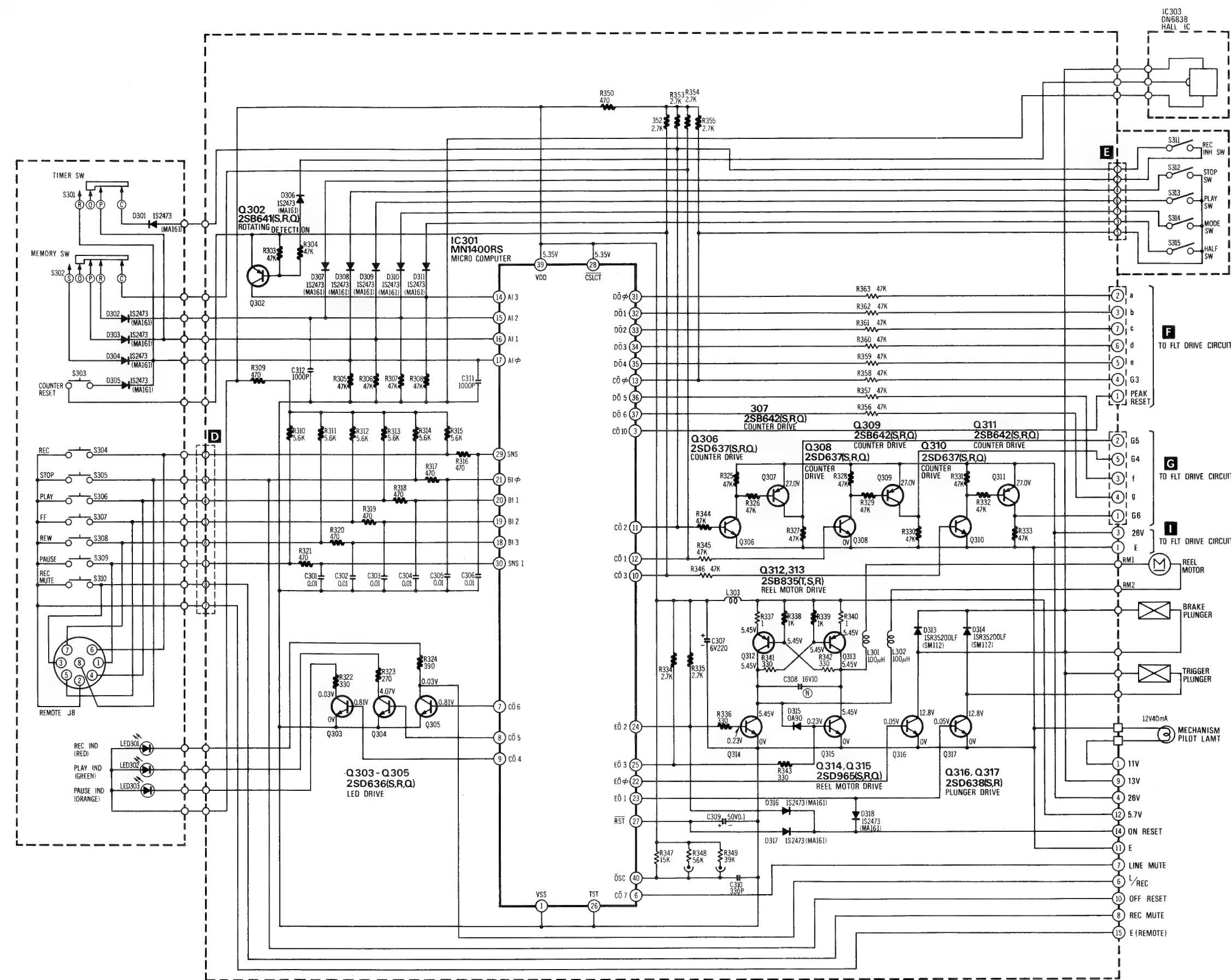


FL METER CIRCUIT BOARD



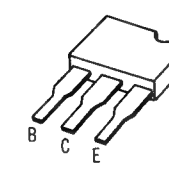
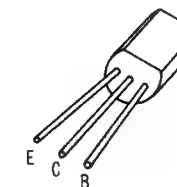
- NOTES:
- The circuit shown in [solid black] on the conductor is +B (bias) circuit.
 - The circuit shown in [dotted black] on the conductor indicates printed circuit, which is included printed type resistors.
 - The circuit shown in [white] on the conductor indicates printed circuit on the back side of the printed circuit board.
 - The symbols (•) indicate connection points between conductors on the front side and back side of the circuit board.
 - Values indicated in [box] are DC voltage between the ground and electrical parts.

SCHEMATIC DIAGRAM MAIN CONTROL SECTION



TERMINATIONS (SIDE VIEW)

Q314, 315

Q302-313
316, 317

NOTES:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. K=1,000 Ω , M=1,000 k Ω . Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μ F) unless specified otherwise. P=Pico-farads.
- All voltage values shown in circuitry are under record mode.

SCHEMATIC DIAGRAM DIGITAL TAPE COUNTER DRIVE SECTION

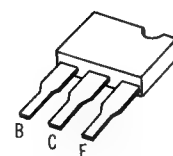
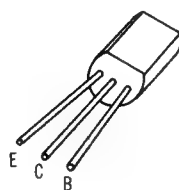
From Meter. Counter Circuit Board

From Meter. Counter Circuit Board



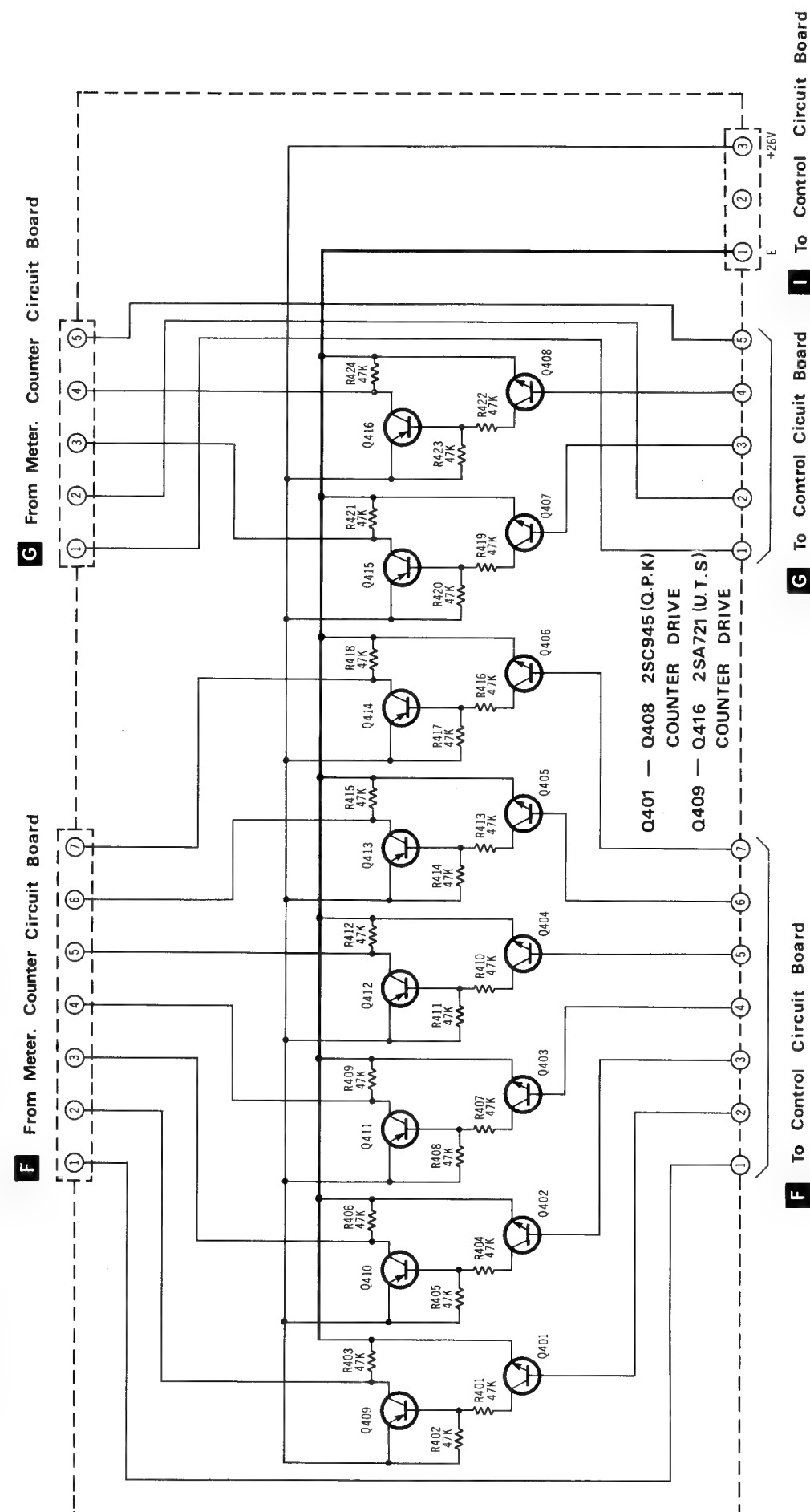
Q314,315

Q302—313
316,317



SCHEMATIC DIAGRAM

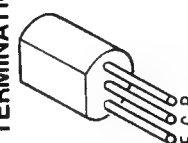
DIGITAL TAPE COUNTER DRIVE SECTION



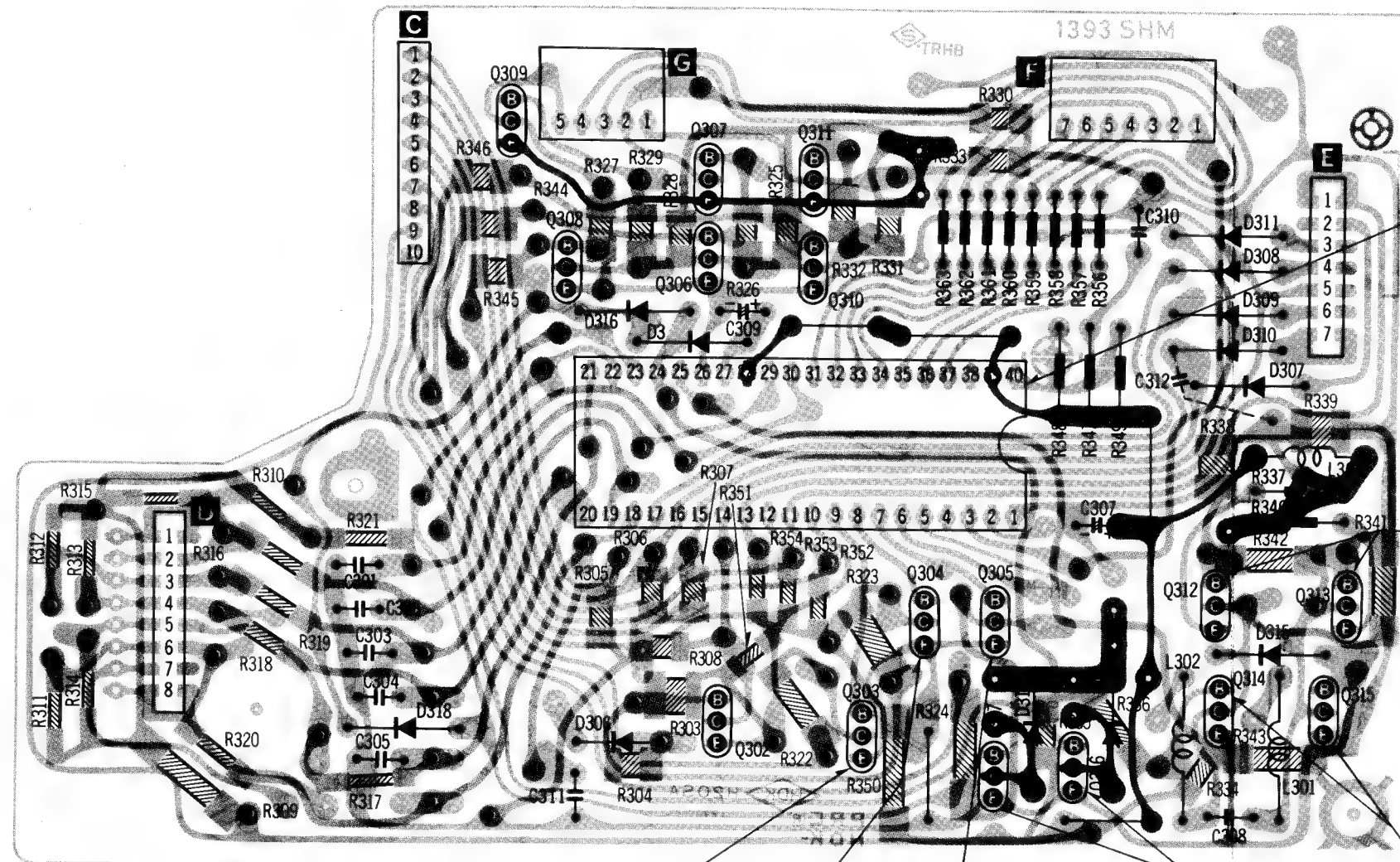
NOTE:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
K = 1,000 Ω .

Q401-408
Q409-416



CIRCUIT BOARD MAIN CONTROL CIRCUIT BOARD



C	0.03V
B	0.81V
E	0V

Q303

2SD636(S, R, Q)

C	4.07V
B	0.02V
E	0V

Q304

2SD636(S, R, Q)

C	0.03V
B	0.81V
E	0V

Q305

2SD636(S, R, Q)

C	12.8V
B	0.05V
E	0V

Q316, 317

2SD638 (S, R)

IC301
MN1400RS

1	0V
6	0.02V
18-21	5.35V
26	0V
27	5.1V
28-30	5.35V
39	5.35V

Q312, 313
2SB835 (T, S, R)

C	5.45V
B	5.45V
E	5.45V

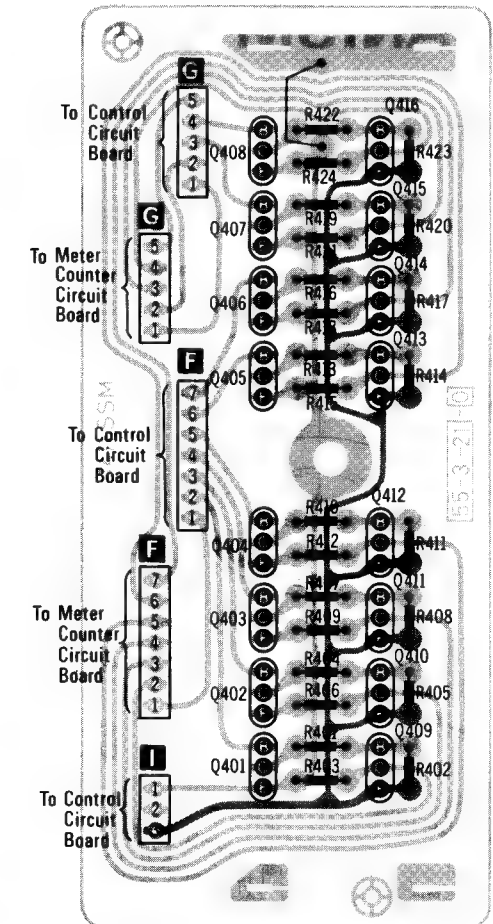
Q314, 315
2SD965 (S, R, Q)

C	5.45V
B	0.23V
E	0V

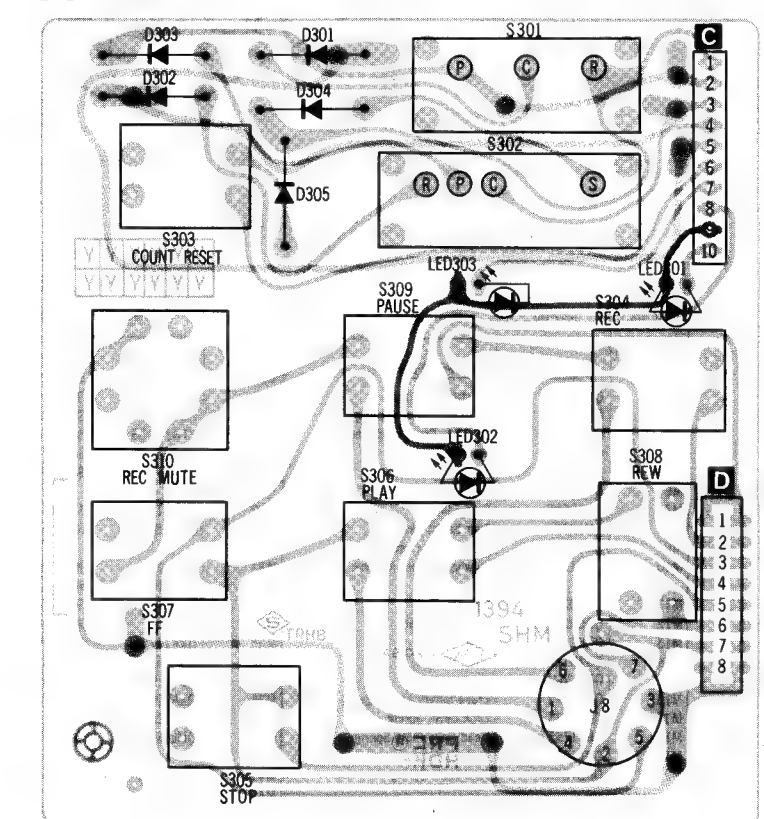
NOTES:

- The circuit shown in on the conductor is +B (bias) circuit.
- The circuit shown in on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in on the conductor indicates printed circuit on the back side of the printed circuit board.
- The symbols (•) indicate connection points between conductors on the front side and back side of the circuit board.
- Values indicated in are DC voltage between the ground and electrical parts.

DIGITAL TAPE COUNTER DRIVE CIRCUIT BOARD



CONTROL KEY SWITCH CIRCUIT BOARD

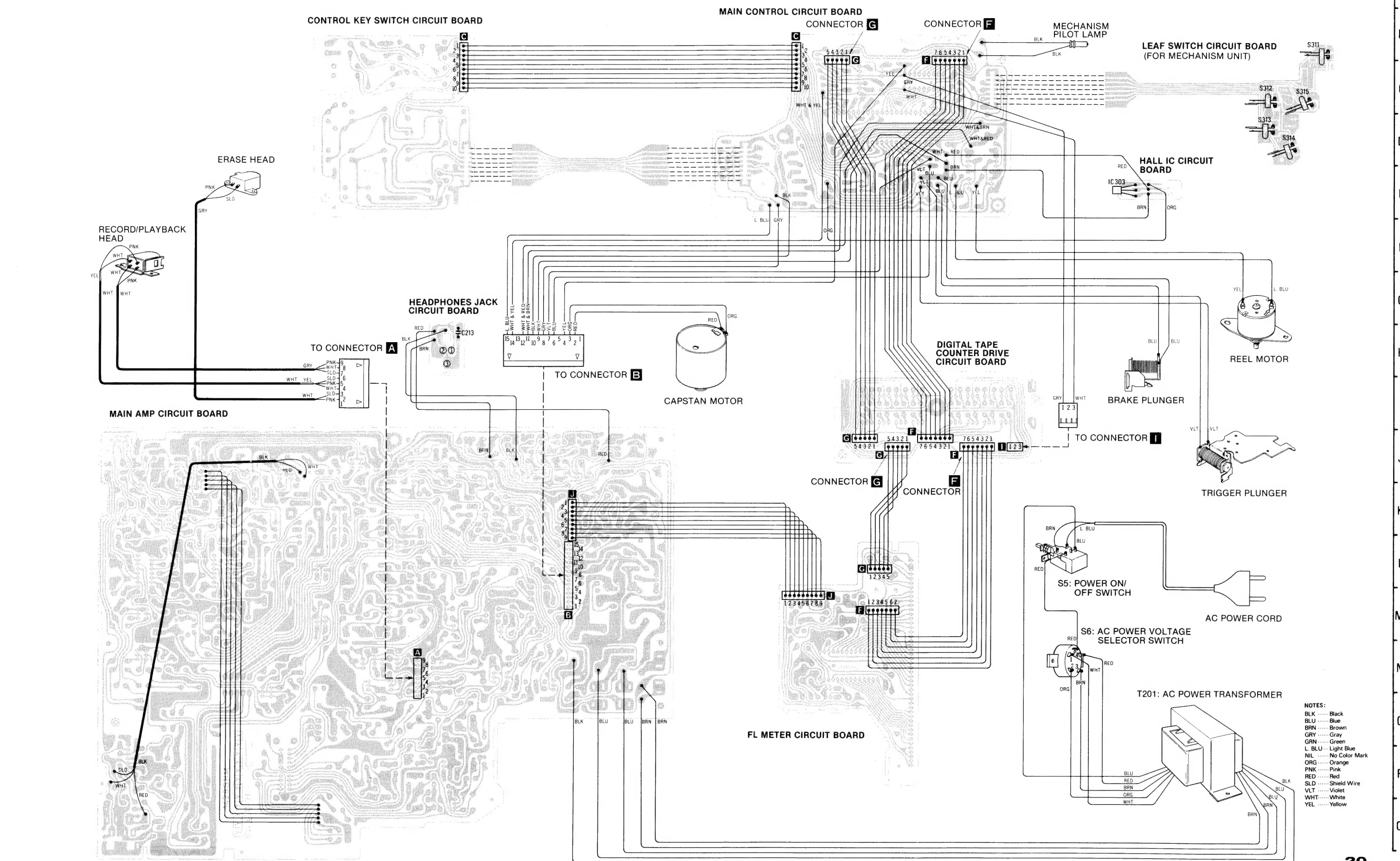


A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q

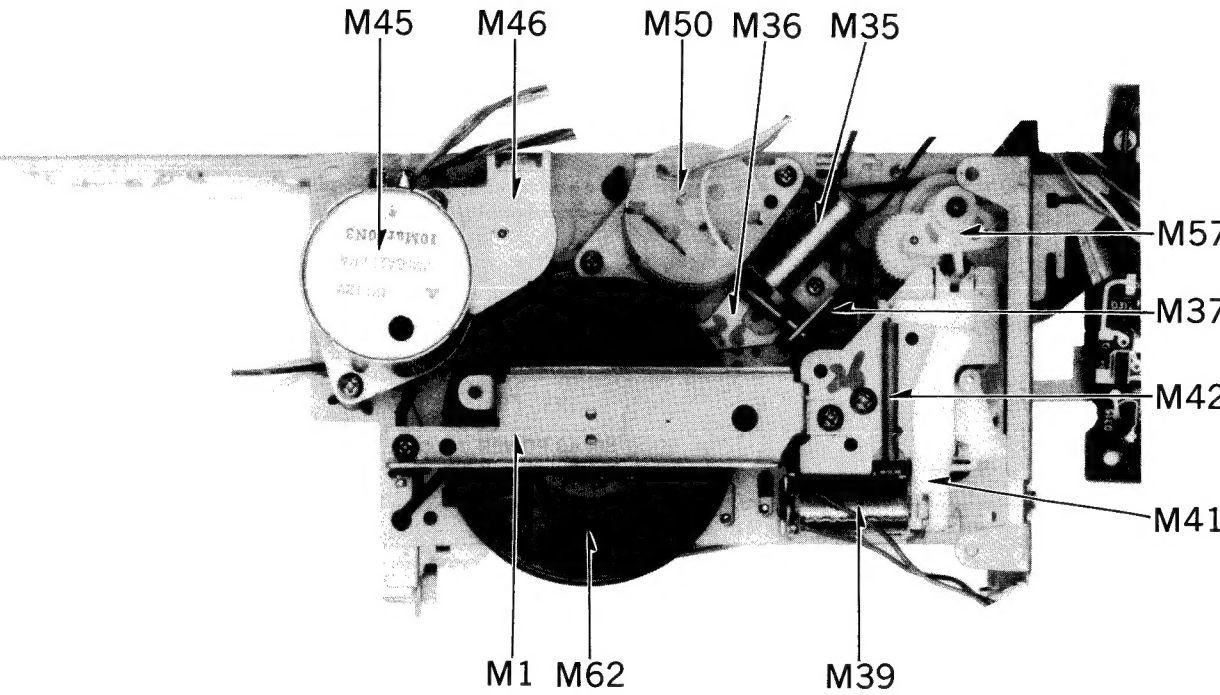
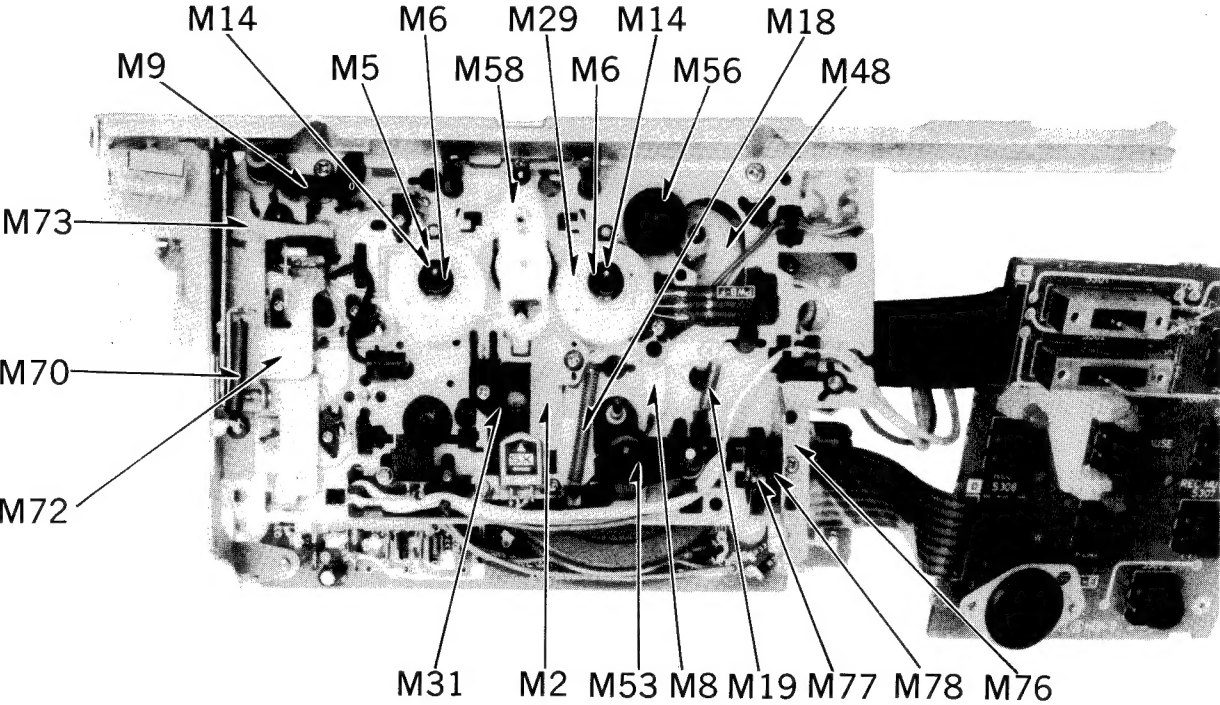


Pressure of pressure roller	350±10 g
Wow and flutter (JIS) Test tape... QZZCWAT	Less than 0.055% (WRMS)

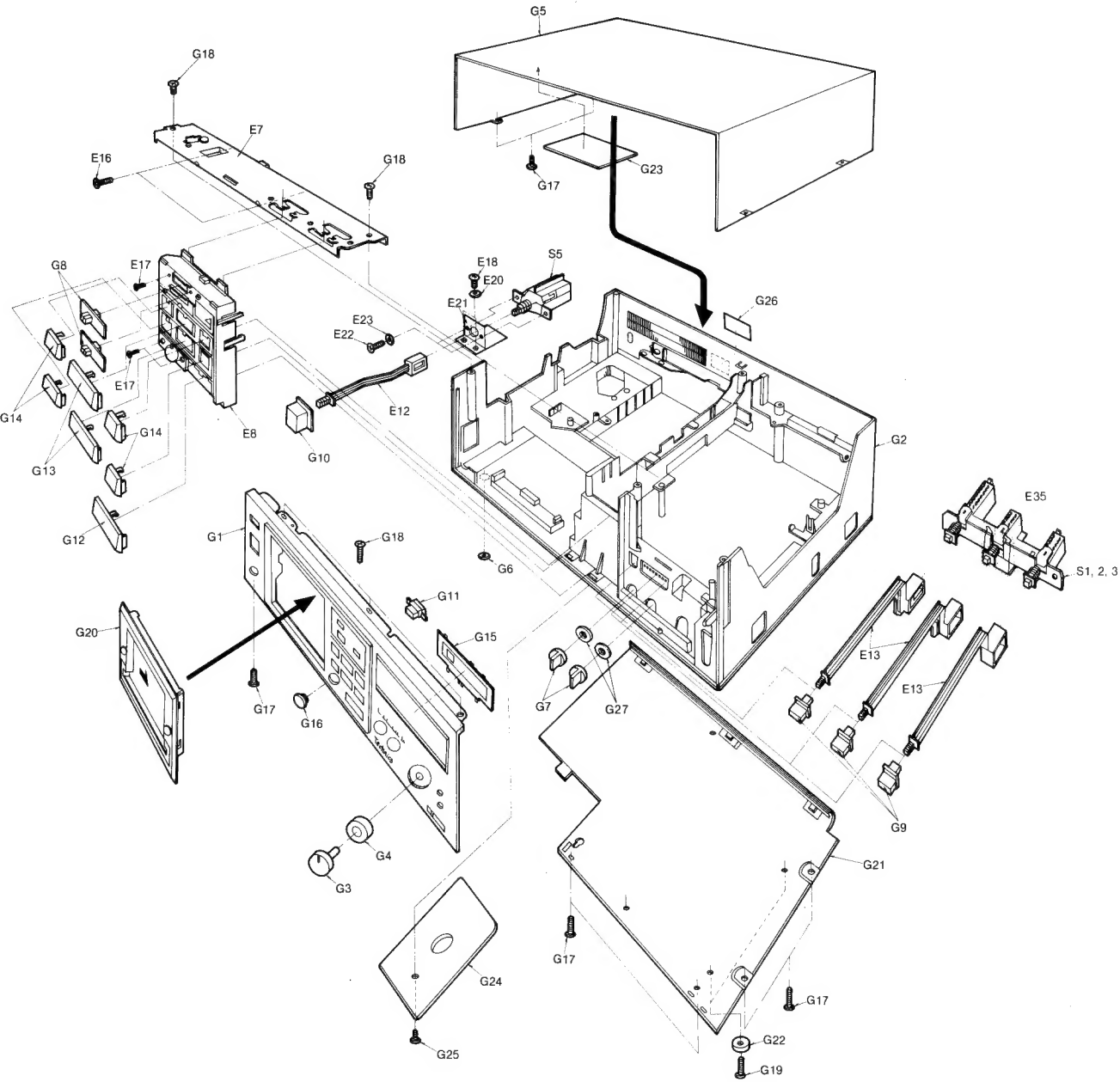
WIRING CONNECTION DIAGRAM



MECHANISM PARTS LOCATION



CABINET PARTS



Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
CABINET PARTS								
G1	QYP0983 "Silver Type" QYP0983K "Black Type"	Front Panel Assembly	G9	QG01694N "Silver Type" QG01694K "Black Type"	Push Button	G20	QYF0459 "Silver Type" QYF0459K "Black Type"	Cassette Lid Assembly
G2	QKM1448H "Silver Type" QKM1448K "Black Type"	Main Case	G10	QG01763 "Silver Type" QG01763K "Black Type"	Push Button (Power Switch)	G21	QGC1196	Bottom Case
G3	QYT0586 "Silver Type" QYT0586K "Black Type"	Volume Knob-A	G11	QG01764 "Silver Type" QG01764K "Black Type"	Push Button (Counter Reset)	G22	QKA1083	Rubber Foot
G4	QYT0587 "Silver Type" QYT0587K "Black Type"	Volume Knob-B	G12	QG01765	Operation Button (Stop)	G23	QE1546	Shield Plate Assembly
G5	QGC1195 "Silver Type" QGC1195K "Black Type"	Case Cover	G13	QG01766	Operation Button (Play, Pause)	G24	QGC1204	Sub Bottom Case
G6	QKA1081	Rubber Foot	G14	QG01767	Operation Button (Rec, Rec-Mute, FF, Rew)	G25	XTN35+20BFB	Screw + 3.5x20
G7	QGT1504 "Silver Type" QGT1504K "Black Type"	Control Knob-A	G15	QGL1146 "Silver Type" QGL1146Y "Black Type"	Meter Cover	G26	QGS2840	Main Name Plate
G8	QGT1505 "Silver Type" QGT1505K "Black Type"	Control Knob-B	G16	QKF9001 "Silver Type" QKF9001K "Black Type"	Remote Control Jack Cover	G27	QBH0125A	Volume Shelter
			G17	XTN3+10B	Screw + 3x10	ACCESSORIES		
			G18	XTS3+10B	"	A1	RP023A	Connection Cord
			G19	QH01299	Screw	A2	QQT2891	Instruction Book
						PACKINGS		
						P1	QPN4064	Inside Carton
						P2	QPA0574	Cushion-A
						P3	QPA0575	Cushion-B
						P4	XZB50X65A02	Poly Bag
						P5	QPS0434	Pad
						P6	QPC0072	Sheet
						P7	QPA0585	Spacer

Parts Change Notice

(D)...For all European areas
except United Kingdom.
(B)...For United Kingdom.



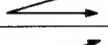
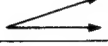
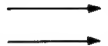

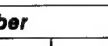

(N)...For Asia, Latin America,
Middle East and Africa
areas.

(A)...For Australia.
(P)...For U.S.A.
(C)...For Canada.

Model No.

RS-M250X

Please revise the original parts list in the Service Manual to conform to the change(s) shown herein. If new part numbers are shown, be sure to use them when ordering parts.

Reason for Change		*The circled item indicates the reason. If no marking, see the Notes in the bottom column.			
1. Improve performance					
2. Change of material or dimension					
3. To meet approved specification					
4. Standardization					
5. Addition					
6. Deletion					
7. Correction					
8. Other					
Interchangeability Code		**The circled item indicates the interchangeability. If no marking, see the Notes in the bottom column.			
Parts		Set Production			
A	Original		Early	Original or new parts may be used in early or late production set.	
	New		Late	Use original parts until exhausted, then stock new parts.	
B	Original		Early	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.	
	New		Late		
C	Original		Early	New parts only may be used in early or late production sets.	
	New		Late	Stock new parts.	
D	Original		Early	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.	
	New		Late		
E Other					
Part Number					
Model No.	Ref. No.	Original Part No.	New Part No.	Notes (* - **)	Part Name & Descriptions
RS-M250X	M52 (N/A/ P/C)	QBP1771	QBP1923	2-C	Holder Spring
"	M58	QXL1409	QXL1604	"	Fast Wind Arm Assembly
"	G6	QKA1081	QKA1093	"	Rubber Foot
"	G20	QYF0459H	QYF0459	7	Cassette lid Assembly

File this Parts Change Notice with your copy of the Service Manual.

Original Service Manual is Model No. RS-M250(D/B) Order No. ARD8007079C.
(N/A) Order No. ARD8010109C17.
(P/C) Order No. ARD8010108C17.

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■ National / Panasonic

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